

RECORD

10/23/2002 - 10/23/2002

F.R. Fosberg

Coll. + 0 - 0

Field and Collection Notes Book	
No. 45	
(June 4, 1950 - June 24, 1950)	
(37300 - 37399)	
RYUKYU ISLANDS	
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1-14	Metahai Lake basin
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Field and Collection Note Book

No. 45

(June 4, 1956 - June 24, 1956)

(37262 -- 37736)

RYUKYU ISLANDS

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begin with #37262
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Ishigaki
Taketomi

Ishigaki

1

June 4 - above Inota

(40) (Photo 950-54)

Secondary scrubby forest,
dense, full canopy,
lianas abundant
esp. Flagellaria + Smilax.
Trees mainly secondary
species - Ficus, Macaranga,
Mallotus, Diospyros,
Cannellia, Ardisia,
Schefflera, Trema.

Undergrowth of Psychotria, ^{Saxifraga}
and abundant ferns,
Angiopteris, Tectaria,
Polypodium, etc.
especially in gulches.
Arenga common.

Leeches abundant on
dead sticks & leaves
on ground.

(4) (Photo 950-54)

Dense forest of small trees not over 10 m. tall.

Quercus, Ficus, etc.

~~Antis~~ Rhub layer very marked. *Lasianthus*, *Psychotria*, *Ardisia*, *Myrsine*

Laecanodermis, *Myrtac.* ~~various~~ *Antidesma*, various other sterile shrubs; ~~the~~ about 2 m. tall, stems average 3-5 m. apart. Trees 2-5 m. apart.

Few ferns, few lianes. Some Zingiberaceae. Almost no other ground cover.

Dead leaves over bare soil general. A few seedlings.

Much logging going on here, even of trees down to 10 cm. dbh. No obvious preference of species - *Styrag*, ~~Laecanodermis~~, Lauraceae, etc. as well as *Quercus*, *Elaeocarpus*, etc.

Locally there are patches of several ferns, apparently spreading by running rhizomes, also of *Alpinia* sp.

But even where there is a slight gully or steep slope the fern ground cover becomes very abundant.

A few *Asplenium nidus* on tree trunks, otherwise epiphytes confined to a few crustose lichens, algae, etc. one small fern.

But several close clinging vines, incl. *Psychotria serpens*, and one or two others are quite common running up into trees.

Tree trunks here quite commonly up to 3 dm. dbh., occasionally larger.

Additional trees in top layer *Ardisia*, *Elaeocarpus*, *Myrsine*.

Ficus not abundant on ridge tops.

1954

(42)

Deep gulch with small stream, huge boulders and some alluvium in bottom.

Trees here are 15 m. or even more tall, many kinds incl. Ficus, Libotium,

Ferns very abundant and many kinds angiopteris and a small tree fern-like sterile species, a big Polypodium, Thelypteris, Oxypteris, etc.

Arenca common, also a big araceous vine and what looks like a Hoya but non-lactiferous, climbing on rocks. Mosquitoes in great numbers (Aedes)

1956 Ryukyu Is.

Inoda Yama, ^{W of m.}
June 4 - 1-1.5 km. 60° W. of N. of
~~Inoda~~ Inodadeep wet ^{wooded} gulch

37262

3

~~Polypodium~~ ^{Polypodium} ~~decussatum (Presl) Copel.~~
common on steep banks
~~near~~ along bottom ~~of deep gulch~~^{Ophiophrys} ~~liukiuensis~~ Hayata

6

63

~~Psychotria~~

occasional in bottom of

5

64

^{Psychotria} ~~liukiuensis~~ Hatusima?

occasional in bottom of

4

65

^{Ficus} ~~ampelas~~ Burm. f.

common in

on rounded wooded ridge

1

66

^{Ardisia} ~~quinqueгона~~ Bl.

common

2

67

^{Ardisia} ~~quinqueгона~~ Bl.

common

6

68

^{Ilex} ~~mutchagara~~ Mak.~~one tree seen~~ ^{I. mutchagara}

1

69

^{Ardisia} ~~sieboldii~~ Mig.?

5

70

^(few) ~~Lemnaphyllum~~ ^{microphyllum} Presl

epiphytic on tree-trunks.

71

~~Lasiacanthus~~

71

^{Lasiacanthus} ~~tashiroi~~ var. ^{pulcherrimus}

rare

ISHIGAKI ISLAND.

100-150 m.

"bird's nest" habit, sterile
fronds spreading and
ascending, fertile ones
more erect.

shrub 0.7 m. tall;

flowers white.

shrub 1.5 m. tall,

flowers whitish

65 tree 15 m. tall, 20 cm. d.b.h.
somewhat buttressed.

200 m.

66

shrub 2 m. tall;

fruit immature

67

shrub 2-3 m. tall;

very young fruit red.

68

tree about 10 m. tall,

cut for timber, log
about 15 cm. thick; flowers
white.

69

shrub 1.5 m. tall.

flowers pinkish white,

anthers turning very

dark in age, punctate

when young and pinkish.

70

vine clinging

very closely to tree-trunk.

(Matsum.)

71

small shrub;

Naka: veins glossy above.

37272 *Ilex goshiensis* Hayata
one tree seen

3 73 *Korthalsella opuntia* (Thunb.) Merr.
parasitic on #37272

5 74 ^{*Castanopsis cuspidata* (Thunb.) Schott}
Quercus cuspidata Thunb.
common

5 75 *Elaeocarpus japonicus* S. & Z.
common

6 76 ^{*Diospyros laurifolia* S. & Z.}
~~*Daphniphyllum*~~?
occasional

5 77 *Dryopteris varia* (L.) Oakes
common, especially in
small ravines and depressions

5 78 ~~fern~~ *Cyrtosorus triphyllus* (Sw.) Copel.
very common in patches,
especially on slopes and
in depressions, terrestrial

5 79 *Alpinia chinensis* (Willd.) Roscoe
common

5 80 *Styrax japonica*
rare ^(var. *inamotensis* Muram.)

5 81 *Randia*
occasional ^{*Tarenna*}

tree about 10 m. tall,
cut for timber; inflorescences
~~from~~ appear abnormal.

OK dark green, branchlets
flattened perpendicularly
to ~~branch~~ plane of
flattening of branches,
but basal joint of a
branchlet often terete.

tree 10 or 12 m. tall,
cut for timber; leaves
bronze beneath,
fruit immature.

tree 10 m. tall, cut for
timber, a few leaves
red; fruit immature.

76 Tree 10 m., cut for timber.

Terrestrial

78 running rhizomes
forming patches.

19 ~~ferre~~ rhizome horizontal,
aromatic when broken;
flowers white, lip with
2 deep pink stripes.

80 tree 8 m. tall 12 cm. d.b.h.
cut for timber.

81 shrub 2 m. tall,
flowers white.

- same *Sagittaria buxifolia* H. & A.
- 37282 *Eugenia microphylla* Abel
occasional
- 5 83 *Ardisia quinqueгона* Bl.
common
- 5 84 *Psychotria* *P. rubra* Poir.?
very common, making up
a large part of shrub layer
- 3 85 (orchid) *Stereosandra koidzumiana* Ohwi (? =
very local, one colony seen
- 5 86 *Psychotria serpens* L.
common, climbing in
trees
- 5 87 (~~laurel~~) *Daphniphyllum teijsmannii* (van
occasional
- 5 88 (~~fern~~) *Hemogramma decurrens* (Hook.) Copel.
~~rare~~ rare in small draw
- 2 89 *Callicarpa innotensis* Masam.
occasional in ravine
- 2 90 (~~laurel~~) *Machilus thunbergii* S. & Z.
occasional
- 7 91 *Myrsine seguinii* Lévl.
common
- 5 92 *Ilex goshiensis* Hayata
occasional
- 2 93 *Antidesma*
occasional
- 5 94 *Ilex goshiensis* Hayata
occasional

150-175m.

- shrub 2 m. tall,
flowers with white stamens.
- shrub 2.5 m. tall;
fruit immature
- shrub 2 m. tall; flowers
greenish.
- S. javanica* (Bl.)
det. L. A. Garay erect, stems whitish
from a fleshy tuber; flower
parts purple-tipped.
- OK young vines, very
closely appressed to
tree-trunk, growing up
from ground. ramifying
in upper branches of
trees; flowers pale greenish.
- tree 6 m. tall, fruit
immature.
- det. H. N.
Moldenke 89 shrub 2 m. tall,
fruit immature.
- 90 small tree, sterile;
leaves glaucous beneath.
- 91 tree 8 m. tall; fruit
immature
- 92 small tree;
fruit immature
- 93 shrub 1.5 m. tall,
fruit immature.
- 94 small tree,
fruit immature

37295 Dendropanax

3

in deep wet wooded gulch

1 96 ~~from~~ *Bobertia subcordata* (Lepel.) Ching
rare1 97 *Trichomanes*
local, on vertical clay bank2 98 *Asplenium* ~~undulatum~~
local, on vertical clay bank8 99 *Randia*?
occasionalJune 5 - south of base
of Maishi Take(43) Chert outcrop in semi
cultivated area. It has
been burned over not
too long ago.Between the chert boulders
are areas of grass - partly
Imperata, partly *Paspalum*,
Andropogon, etc.On the rocks is a
scrubby woody vegetation
of *Ficus*, *Toddalia*, *Mallotus*,
Euphorbia (?), *Melia*, *Psidium*,
Boehmeria, *Pongamia*?
Arenca, andone or two other shrubs,
clumps of *Miscanthus*,
and *Polypodium*,
scelopendria and
Nephrolepis, *Dianella*fertile fronds erect
dark green.small tree or large shrub.
fruit immature.Tangled in this are
Yiti, *Asplenopsis*, *Smilax*,
Bauhinia, *Alysicis*?
Pueraria, *Lygodium*,
a thorny trifoliate vine,
and *Hoya*.Some *Rubus*, *Cyperus*,
Thelypteris, *Lilium*
longiflorum, *Pittosporum*,
Lauraceae?, *Rosa*,
and *Agave americana*.
Murraya, *Pernonia*, *Carmona*,
Oxalis, *Emilia*,
Leucas, *Setaria*, (Melast.?)
Gynura, *Conyza*, *Paspalum*,
Wahlenbergia, *Andropogon*,
Artemisia.Peppery fields abandoned
or fallow - pure stands
of *Caricium*.

June 5 - Chert hills
above Water works.

(44) Unburned chert
outcrops.

Few species noted
here that were not
on the burned hills -
Polygala, *Viola*,
Polypodium thunbergii,
Psychotria serpens,
Vernonia cinerea,
Nephrolepis exaltata,
but everything is
much more luxuriant.
Less weeds, grass thicker
around base.

Abandoned or fallow
paddy fields nearby
are covered by a pure
stand of *Panicum*.

Well up the slope *Dendro-
panax*, then *Quercus*, come
in. *Podocarpus* general
but only saplings.

(June 5 - just south of
base of Maishi Take.

small hill of chert,
with bare rocks and
bushy vegetation.

- 37300 *Polygala* ^{javanica} in rock crevices
1 01 *Viola*
at base of rock face
3 02 *Polypodium Thunbergianum*
in crevices on rock face

same - (roadside)

- 2 03 *Echinochloa* ^{hi polystachya} in thick grass
5 04 *Vitex* ^{infida} on steep bank
7 05 *Ficus* ^{creda} on steep bank

June 5 - 1 km. s.e. Maishi Take

roadside thicket

- 5 06 *Ficus* ^{sepioides} common
5 07 *Acacia confusa* ^{Merr.} abundant, probably planted
along shallow ravine
3 08 *Cerbera manghas* ^{L.} common

80 m.

Platanus ^{thunbergiana}

- 04 shrub 1.3 m. tall,
flowers violet.
05 shrub 2.5 m. tall,
ripe figs red, mostly
immature.

40 m.

- 06 low bushy tree 6 m. tall,
figs immature.
07 low tree 3 m. tall (others
to 6 m.), trunk crooked,
flowers yellow, fruit immature.
08 small tree, flowers
white, center red, calyx
pale green, tube slightly
dilated only near top.

same - small
chert outcrop with
some soil.

37309

Conyza

5

common on soil

5

10

Erulia sonchifolia (L.) DC.

common on soil

5

11

Cyperus

common on soil

5

12

Ficus

very common

1

13

(grass)

Polypodium glaberrimum (L.) A. Comm.

rare

6

14

*Ampelopsis*very common climbing
on rocks and bushes

5

15

Mallotus

common on rocks

3

16

Nephrolepis

common on rocks

5

17

Polypodium scolopendria

common on rocks

3

18

Polypodium scolopendria Braunf.

common around base of rocks

5

19

Podium

common clambering over rocks

2

20

Hoya carnosa (L.) R. Br.common, climbing on
rocks.

45 m.

erect

10

base of stem purplish;
flowers purple, little
exceeding involucre.

11

erect culms scattered,
solitary.

12

shrub 2 m. tall,
mostly sterile at this season.

13

erect, one fertile culm,
several tillers.

14

vine, flowers greenish,
petals very caducous,
fruit blue when ripe,
mostly immature.

15

shrub 1-1.5 m. tall,
leaves green beneath
except when very young
fronds plane, leathery,
pendent

Braunf.

probably same as #37318
but dwarfed by unfavorable
habitat.

16

fronds erect

17

scrambling shrub,
strong odor when broken.

18

prostrate vine, leaves
very fleshy, flowers white
with red center, waxy-fleshy.

37321 (Apr.) *Trachospermum* *amblyanthemum* (L.) Nakai
common on rocks

3 22 *Raphiolepis* *hutchinsonii* (Hort.) Nakai
common on rocks

5 23 *Bauhinia* *gypsea* (Thunb.) H. & A.
local on rocks

same - weedy cultivated
sweet-potato patch.

1 24 *Euphorbia hirta* L.
occasional

5 25 *Setaria verticillata* (L.) Beauv.
rare

3 26 *Daucus carota* L.
occasional

2 27 *Digitaria chinensis*
occasional

3 28 ~~*Meibomia*~~ *Meibomia* *meibomia* (Thunb.) H. & A.
occasional

5 29 *Ranunculus* *scutellaria* (Thunb.) H. & A.
common

5 30 *Digitaria ~~pectinata~~* *pectinata* (L.) H. & A.
common

scandent or semi-scandent
shrub, lactiferous, mostly
sterile.

erect shrub \pm 1-1.5 m.
tall, fruit immature.

scandent shrub,
flowers pale yellow.

40 m.

purplish

40 m.

spreading, caespitose

40 m.

erect, flowers white

40 m.

culms spreading

fragrant when
broken; flowers pale lavender.
stoloniferous; petals yellow

40 m.

culms spreading,
rooting at nodes,
scapes somewhat ascending

1956 . Ryukyu Is.

mts. 1-2 km. s.w.
June 6 1st of Kabira

(nos. 45-62 on photo 950-65)

- (45) Lower slopes mixed small pine and various secondary shrubs and small trees. In more open places Miscanthus is common but no very dense. Much Pteridium, Elephantopus molle.

- (46) Pines become thicker, especially saplings, upward. When sharp ridge is reached, of granitic boulders, the n.w. side is covered by a scrub forest 3-4 m tall of slender trees of various kinds.

- (47) On ridge itself the same, with some cycads, pine, Pandanus. On other side, pines.

- (48) Ridge with tangled low vegetation - ferns, Ficus, etc. difficult to traverse even constantly using machete. Much Lygodium. some Miscanthus

Small yellow jacket nest. The insects do not seem to be bothersome until the tree the nest is on is touched. Then sting viciously. (hadzu Y) (Chachi J) Usually 2-3 wasps on nest (3 cm diam.) Mosquitoes present on ridge, rather aggressive. A small black species, also an Aedes. Possibly breeds in Pandanus axils.

Most common tree in broadleaf scrub forest is pinnate leaved one with 3 follicles. Stingy caterpillar "yamagi" said to like this tree.

- 49 Upward on n.w. slope, scrub forest gets a bit taller, perhaps ~~to~~ 5 m. canopy dense. Shrub layer fairly well developed, almost nothing on ground, a few ferns + sedges + seedlings. Can be walked thru with little use of machete in places.

varicosa
spicata
rare
now.

"Yamagi" seen on
Cinnamomum rather
 surrounds twig, is
 brown, rows of black
 and yellow specks on
 back, sparse short
 black bristles, longer
 stiff bristles pointing
 downward on legs,
 seeming to help cling
 to twig.

50 On very rocky ground
 stature of scrub is lower
Eurya, *Eugenia*, other
 cricaceous lft. plants
 more prominent.

49 Near top ^{side ridges} ~~stature~~
 becomes lower scrub
 thicker, 2-4 m. tall.
 trunks 2-5 cm. thick.

51 Taller & larger trees
 in shallow draws.

200 m. 52 On first main top the
 vegetation is a dense
 scrub about 4 m. tall.
 Many species, including
Myrsine (a *Temnostroemia*)
Ficus, *Dendropanax*,

Cinnamomum *Eurya*,
Eugenia, *Claoxylon*, etc.

53

On broad flat ridge
 west from this is a
 forest 5-7 m. tall, trees
 up to 20 (-nearly 30) cm., mostly
 up to 10 cm. full canopy,
 sparse shrub layer,
 many species of trees
 + shrubs. *Garcinia* *spicata*
 rare here. Trees 1-1.5 m.
 apart. Some lianes -
Flagellaria, *Smilax*, etc.
Ferns fairly abundant
 on ground.

In places the forest is
 largely *Ficus*, *Claoxylon*
 (sp.), several *Sauraceae*,
Camellia,
 in other places largely
Quercus *cuspidata*.

At about 200 m. or a
 little higher *Pleuroblastus*
 comes in, at first
 mixed with forest,

54

~~etc~~ then forming
 almost pure brakes.
 A few old pines scattered
 around edges and on
 ridges in these brakes.
 Canes finger size or smaller,
 orange to greenish.

Clump forming but also with underground horizontal rhizomes clumps coming from side branches from these, single culms also. Blade of culm sheaths appressed and divergent on same culm.

These brakes are about 4 m. tall. They occur in patches on the ~~n. e.~~ sides of the high crests, but the highest peak has none, but is wooded all over. On high crests the brakes are lower in stature, 1.5 - 2 m.

(55) ~~50~~

(56)

In the canyon behind Kabira are patches of bamboo down to 1500 m or even lower. No pattern to distribution except that they are on ridges separated by wooded ravines. All have a few spreading umbrella-shaped pines.

Some low scrub in with bamboo near crests.

(59)

Main ridge to west seems to have better forest, but trees very gnarled and spreading.

57

In saddle the forest is about 10 m. high, trees up to 15-20 cm. dbh. many of them clusters of stump sprouts. Canopy full, but not dense, shrub layer well developed. Main canopy largely oak. Ilex forms a loose second story. Little on ground - a few ferns, terrestrial orchids, sedges, *Ligularia* etc.

(5-8)

(59)

In main draw leading up to west ridge and on ridge, itself, mentioned above, trees to 15 m. and 3 dm. dbh. Many ferns on ground. Dense canopy. Leeches in bottom of ravine. Well developed shrub layer. Many species of trees, esp. *Quercus* + *Elavocarpus*. One tree seen 5-6 dm. dbh. 15-18 m. tall.

60

~~at head of small~~
~~ridge of valley~~
 has thick forest
 about 6-8 m tall.

Many spp. incl.

Dendrotrax, ydessa,
 etc. Tangled with

Freycinetia, Smilax
 Eleoagnus, Flagellaria, etc.

61

Slope of ~~ridge~~ ^{valley} not
 far from mouth - dense
 forest about 8-10 m.
 high trees mostly
 small, 10-15 m. dbh.
 occasional large
 Ficus with compound
 trunk.

Lianas, incl. Entada,
 abundant. Many
 ferns. shrub layer
 very sparse.
 Some Alocasia.

62

Near the bottom
 of the valley Ficus
 become abundant.
 Maesa and Alocasia
 common. Secondary
 species, as Mallotys
 become dominant.
 Vines, esp. Flagellaria
 become more abundant.

1956 Is Ryukyu Is.

June 6 - about 1 km. s.w. of
Kabira
in steep trail in semi-
open vegetation

37331

Mitrasacme pygmaea B. & C.

very local

37332

Myrsine javanica (Lam.) Benth.in scrub forest on steep
slope

2 32

Citrus *limbata* Hayata
wild

1 33

Ligularia tussilaginea (Burm. f.) Makino det
Farfugium tussilaginea Walpers 1974
common

2 34

Cinnamomum?
common

ridge east of ~~Mae~~ Mae Take
June 6 - 1.5 - 2 km. s.w. of Kabira
on high wooded ridge

1 35

Ardisia *sonchifolia*
occasional

2 36

(Lam.) *Medusa chinensis* L.
occasional

5 37

Elaeocarpus japonicus S. & Z.
common

5 38

Ficus *ventricosa* Thunb.
occasional

5 39

Elaeocarpus sylvestris (Lam.) Merr.
common

1 40

Pteroblastus *longicaulis* (Lam.) Merr.
locally abundant on
high crests and on patches
on north slopes.

40 m.

flowers white

100 m.

slender ~~shrub~~ small
tree, 3-4 m. tall; fruit
very immature.

125 m.

sterile "yama-gobo" (?)

sterile shrub, host for
brown "yamagi" or
stinging caterpillar.
"shiro tabu"

200 m.

small slender shrub
0.8 m. tall; fruit immature.small tree, sterile.
"akra tabu", bark used
for "okinawa incense".

tree 5 m. tall; fruit immature.

small slender tree 4 m. tall.

tree 3 m. tall.

see F.B.

structure

culm sheath

blade

abundant

or divergent

on same cane.

forming dense brakes 2-4 m. tall,
canes greenish to orange,
in clumps or solitary, clumps and
solitary canes from branches ^{top} bottom
of running rhizome;

32

1956 Ryukyu I.

37341 *Adiantum* *flabellatum* L.
common, terrestrial✓ 42 ~~*Adiantum*~~ *lanceolatum* L.
occasional, terrestrial7 43 ~~*sub*~~ *Tridactylon* *deltoideum* (Willd.) Blume
occasional44 *Dendropanax*
common

ISHIGAKI ISLAND.

33

petioles black

petioles green

tree 8 m. tall (others seen taller)
fruit immature, seeds in cell.tree 3 m. tall, flowers
green.

June 7 - above Yochubara
(nos. on Photo 950-113)

- (63) Forest in lower part of canyon above water course of *Ficus*, *Mallotus*, *Ardisia*, *Diplospora*, *Cyathea*, *Quercus*, *Wendlandia*, *Scaevola*, tangled undergrowth of *Arenca*, large ferns, diaceous vines, *Caesalpinia*, shrubs, etc.

- (64) At about 100 m. on the east wall of the gulch *Quercus* becomes dominant forming a loose forest 10 m or so tall with thin undergrowth. *Cyathea*, *Claoxarpus*, *Ardisia*, etc. also common. Terrestrial ferns, *Blechnum*, etc. common. On some gentler slopes a complete understorey of the diminutive tree fern. trunk 2 m. or less, fronds to 2 m. or more. sections of trunk used as bases for house plants.

- (65) On a ridge coming down to west of this gulch *Quercus* is dominant in a drier type of forest 10-12 m. tall. A distinct second story 5-8 m. tall formed of *Ardisia*, *Diplospora*, *Eugenia*, etc. A shrubby layer of *Psychotria*, *Lasiacanthus*, *Artidesmos*, small *Cyathea*, *Eugenia*, *Angiopteris* etc.

Ground cover sparse, of ferns, seedlings, *Alpinia*, broad leafed grass, etc.

Some *Smilax* but lianes not prominent.

- (66) Upward forest becomes more diversified. *Freycinetia* common. Some epiphytic *Asplenium nidus*. "*Sada mushiru*" a "*Sarumushiru*" young fronds eaten, cooked, at time incense is burned. Cooked fronds have an odor much appreciated by older men & women. Not eaten much now.

- (67) On level ridges at higher altitudes the trees reach 15 m. tall and 5 dm. dbh. Mostly 3-4 dm. or smaller. *Quercus* most abundant but many others. thick shrub layer about 2 m. *Psychotria*, *Antidesma*, *Schefflera* etc. a few small bushes of *Pleioblastus*.

- (68) Near summit stature of trees becomes lower. ferns both terrestrial and epiphytic become more abundant. Bamboo becomes more abundant. Tree trunks 2-3 dm. dbh.

- (69) At summit is a patch of bamboo with only a few scattered stunted trees. The patch is on the north side. Oaks and small lauraceae are most common trees around summit.

Bamboo is about 4 m. tall.

- (70) Next mountain eastward is much higher, and has a very large patch of bamboo, with low forest in shallow ravines.

- (69) The bamboo here seems identical in every respect with that on Kabira Mts.

1956 Ryukyu Is.

June 7 - ^{mountain} ridge above
Yoshihara Villagein thick wet woods
near summit

- 37345 *Polypodium thurbergianum*
occasional, epiphytic
well up in tree trunks.
- 5 46 ~~*Elaphoglossum*~~
large colony on shaded rocks
- 6 47 ~~*Neolitsea*~~ *cinamomum*
common around edges
of bamboo brake
- 1 48 *Raphiolepis*? ~~*binhiensis* (R. H. S.) N. S. P.~~
common in edges of
bamboo brake
- 2 49 *Podocarpus macrophyllus* (Thunb.) D. Don
occasional in understory,
(not forming a
canopy layer)
- 6 50 *Neolitsea* ^{H. K. Allen} ~~*binhiensis*~~
occasional in canopy layer
- 6 51 *Ardisia* ^{quinquefolia}
common
- 6 52 *Ilex* ^{gastrocarpa}
occasional
- 6 53 ~~*Dioscorea*~~
common
- 5 54 *Randia*
occasional
- 5 55 *Eurychorda* ^{lanceolata} T. Ito
rare
- 6 56 *Antidesma japonica* S. & Z.
common in undergrowth
- 5 57 *Scleria* ^{lanceolata} Forst.
occasional

400 m

Platanus thurbergiana Kaulf.*Chromolaena ovata* (R.) Presl

- sterile fronds mostly
curved downward.
- small tree, 5 m. tall,
ends of branches
bunchy, compact.
- small tree 4 m. tall;
fruit immature.
- sapling 2 m. tall
sterile (no mature trees seen)
- tree 10 m. tall; fruit
immature.
- small tree very young
fruits pinkish.
- small tree; fruit immature.
- tree 8 m. tall; fruit
immature.
- small tree; bud only.
- small shrub, stems
green.
- small shrub, fruit
immature.
- caespitose

same - ³ high wooded ridge 350 m.

37353 ~~Styax~~ *Adiantum yagasakiense* Nakai

5 ~~very~~ rare

2 59 ~~Vaccinium?~~ *Vaccinium* Nakai

rare

3 60 ~~Polygodium~~

occasional on mossy boulders

6 61 ~~Cinnamomum?~~

occasional

same - wooded ridge

3 62 ~~Lasianthus?~~ *Lasianthus* Nakai

rare

2 63 ~~Andisia~~ *Andisia* Nakai

common

4 64 ~~Lasianthus~~ *Lasianthus* Nakai

occasional

5 65 ~~Cinnamomum~~ *Cinnamomum* Nakai

rare

6 66 ~~Pteris~~ *Pteris* Nakai

common locally in
disturbed part of forest

4 67 ~~Asplenium~~

common locally, terrestrial

5 68 ~~Tectaria~~ *Tectaria* Nakai

very common, terrestrial

~~same - small wooded ridge~~

5 69 ~~Croton~~ *Croton* Nakai

very local

tree 7 m. tall, leaves
somewhat glaucous beneath.
shrub 2.5 m. tall, sterile.

Prunella *Prunella* (Nakai)

tree 8 m. tall; fruit immature

Prunella (Nakai)

200-300 m.

Prunella (Nakai)

shrub, fruit pink.

shrub

small tree; leaves
glaucous beneath

Prunella (Nakai)

Prunella (Nakai)

shrub 1.5 m. tall

1956 Ryukyu Is.

same - small wet
wooded valley
there

37370

Cynathea

Cyathea
abundant, forming
a large part of understorey
Oxycarpus *podophylla* (H. & A.) (Cepha-

Oxyechinus padalyika (Horn.) Ceph.

same — Tangled disturbed forest on lower slopes in valley mouth

37371

Capricorn annuum L.

have

2 72

Cladagnus
common

1 73

Polygonum
common

6 74

Turpinia turpida Nakai
common

common

2 75

~~Psychotria~~ *Ophiorhiza lincolniensis*
common

common

5 76

Costus?

very local

same - wet valley bottom

77

Pleurostachys ^{blastus}

occasional

150 m.

trunk 1.5 m. tall,
leaves ascending.
(2 leaves represented,
one with tip from another
from same plant).

80-100 m.

tangled herb, fruits
red, not very hot.

scandent shrub
sterile; fruit said to be
eaten "subing"

scandent; succulent
young stems slightly
acid, peeled and eaten
"sume"

tree 6 m. tall, fruit
immature.

erect, 0.5 m. tall; flowers
white

herb 1 m. tall, leaves
conspicuously spiralled,
flowers white.

80 m.

rhizomes deeply buried,
horizontal, branches
arising from the bottom
of rhizome at intervals
of 0.5 m. or more.

1950 Ryukyu Is.

June 8 - Reef on east coast north of Todoroki #9 area perhaps 1000 m. wide

~~self~~ reef margin not at all raised, gently sloping off to a margin cut by surge channels, a few of which penetrate 50 m. or so, the rest the zone where a number of species of flat, short-branched corals are common. Seems to be basically a growth surface with a smooth Porolithon in area of numerous surge channels but not ~~so~~ very actively growing.

The zone of few surge channels shows abrasion and some flat corals, also abundant Turbinaria on back part, making an almost continuous dark drab green band about 20 m wide.

Then typical rather minutely rough reef flat for 300 m. or so, with thin algal belt.

The growth surface on the outer 50 m. is evidently a veneer on an old cut surface ~~about~~²⁻³ dm. below the reef flat level. A few remnants of the old level remain, badly eaten and undercut.

No obvious agent ~~of~~ of abrasion but much abrasion evident on all bumps and points on algal surface and on reef flat remnants. A few loose rocks in deep tide pools, none lying on surface.

The 300 m. of reef flat is very slightly rolling in topography and slopes very slightly toward back and front from a central high area. The total relief is probably not 2-3 dm. covered by a rather good cover of algae.

inner has
hills
rounded
cobbles
stony
sparsely
over it.

The 400 m. next inward is lower and has a very irregular surface with a relief of perhaps ~~1~~^{some} 1 m. patches being deep and sand bottomed, others shallow and rough and covered

by a large brown alga. This area has water flowing strongly northward at low tide, as there is no escape seaward through the reef ridge.

In shallower sand bottom pools is a nod of *Thalassia*, *Halophila* and *Cymodocea*.

The 300 m. between here and beach is shallower, not so rough but not smooth, with many large boulders covered by an algal felt with sand.

Bordered just below beach by a typical erosion ramp.

see 20. 44. 54

37378

Turbinaria

dominant on a strip just back of reef margin

~ 79

Sargassum

dominant on shallower ~~flat~~ areas in central part of reef.

~ 80

abundant on inner part of outer reef flat.

0 m.

mustard brown, soft.

- 37381 *Halimeda stipitata*
common on outer part
of reef at low tide level.
- 2 82 *Liagora*
dominant on outer reef flat
- 83 *Halophila*
abundant locally
in sandy areas at
about mean low tide
level on outer edge of
inner reef flat.
- 3 84 ~~*Cyrtospora*~~ *Halodule* *uninervis* (Forst.)
abundant locally in
sandy areas at about
mean low tide level
on outer edge of inner
reef flat.
- 4 85 *Thalassia hemprichii* (Ehrenb.)
abundant in sandy
areas at and somewhat
below mean low tide
level in middle part
and inner part of reef.

June 8 - mouth of Mizara Gawa
mangrove swamp

- 5 86 *Bruguiera conjugata* (L.) Merr.
common
- 3 87 *Excoecaria agallocha* (L.) Merr.
rare
- 6 88 *Rhizophora mucronata*
abundant

erect from stalk
buried in sand.

rhizomes buried in sand
leaves partly protruding

Aschers. det. C. den Hartog 1969

rhizomes buried in sand.

Aschers in
Petermann
det. C. den Hartog 1969

rhizomes deeply buried
in sand.

0 m.

small tree, 3 m. tall,
calyx red, radicle
pendent, hexagonal
in cross section.

shrub 2 m. tall, buds
whitish.

small trees, 3-4 m. tall,
with stilt roots

June 9 - above Kaiman
on Miyama

(71)
(Photo
950-10)

oilfoliate
tree
Diospyros

Lowland thickets of
Ficus, *Macaranga*,
Premna, *Pochonera*,
Mallotus, *Diospyros*,
Barringtonia
tangled with *Caesalpinia*,
Canavalia, *Flacellaria*,
Ampelopsis, *Smilax*,
Pongamia?, *Cibotium*, *Glochidion*,
undergrowth of *Alcornoque*,
Alpinia speciosa, ~~etc~~
Psychotria, *Evodia*, *Maesa*

Paspalum conjugatum
abundant along trails.

A large *Ficus*, 15-18 m. tall,
covered by epiphytes and
aroids suggests what
the forest may have been

(72)

Farther along the
secondary thicket becomes
more scrubby and
has more native forest
species in its composition
at about 100 m. *Quercus*
~~lesson~~ and *Fraxinus* appear,
also *Centideuma*, etc.

(73)

Old fields at about 100-120 m.
being invaded by *Melia*,
Xanthoxylum, *Macaranga*,
Mallotus, etc.

(74)

Lower slopes covered
by a dense low wood
of many species,
mostly those associated
with *Quercus*, but
a few secondary ones.
Trees mostly 5-8 m
tall, less than 10 cm. dbh.
Many are clusters
of stump sprouts.

75

Along the stream valley
the trees are taller about
10 m., considerable diversity
of species, but few trees
over 10-12 cm. dbh.
Shrub layer rather
marked, but possible
to walk without much
cutting. Rather few lianes

(76)
(photo
949-
950-11)

700 m?
350

Up the valley the forest becomes taller, more and more big trees, much wetter, more ferns and much *Freycinetia*.

Epiphytes more common here. Small species of tree fern common.

Much lumbering ~~is~~ is being done in this area.

(77)

Upward the forest becomes wetter, more luxuriant but of lower stature.

epiphytes very common.

This would almost be regarded as rain forest. On ridge stature is still lower.

(78)

On a broad horizontal ridge ~~to~~ just below summit is ~~thick~~ forest 10 m. or so tall.

Here are mud flats, locally, with no ground cover and little or no shrub layer.

Where there is no mud, shrub layer and ferns very well developed.

soil on summit Amotom

pH 6 surface soil - brown

pH 4.5-5 3-10" down strong brown

pH 4-4.5 10"-30" " " "

summit covered by extensive brake of *Pleiothlastus* - about 2 m tall on exposed summit, taller lower down. To 4 m.

A few shrubs scattered in the bamboo - *Cinnamomum*, *Viburnum*

Ground cover very well developed in bamboo of *Oplismenus* ferns, etc. *Ligularia*

Going down s.w. ridge the same sequence is repeated in reverse. The forest is quite wet for a good distance down. Then a ridge that is drier, the forest largely *Quercus* but small size, ferns few in number, undergrowth not luxuriant.

Then in valley bottoms above Shira Mäzu there is tangled lowland forest.

June 9 - Shira Mizu, ^{tribute, any}
~~to~~ upper part of north
 branch of Nagara-Gawa.

37389 *Mallotus* ^{sp. nov.} 30 m.
 in thicket in ~~steep~~
 deep river ravine

4 90 *Eugenia jambos* L. 50 m.
 June 9 - bottom of stream
 valley

June 9 - southwest
 slopes of Omoto-san,
 about Shira-Mizu

6 91 *pass* ^{Tapezium} 250 m.
 on earth banks along
 trail in woods

2 92 *Asarum* 450 m.
 common in wet woods

6 93 *Andropogon* 475 m.
 common in wet woods

3 94 *Damnacanthus* 500 m.
 occasional in wet woods

June 9 - plateau just
 south of summit of
 Omoto-san. ^{Dake}
 in wet low forest

6 95 *Ligustrum* ^{L. lucidum} 500 m.
 rare.

9 96 *Scleria* ^{(L.) Panz.}
 common

small tree or large shrub.

spreading tree,
 fruit pinkish yellow
 when mature, edible,
 with strong flavor.

sterile; rhizome with
 strong odor, between
 licorice and Vicks
 Vapo-rub.

475 m. small tree 3 m. tall.

500 m. shrub 5 m. tall,
 leaves glossy; fruit
 immature.

500 m.

small tree 4 m. tall;
 flowers white, fragrant.
~~several~~ stems from base.

56

1956 Ryukyu Is.

37397

Psychotria

common in undergrowth

5 98

*Polypodium*occasional, climbing
tree trunks

5 99

~~(rare)~~

occasional

37400

~~*Eurya*~~*Eurya sakishimensis* Hayata

2

rare

3 01

(fungus)

rare

4 02

Mussaenda

occasional

June 9 - summit area

of Omoto - ~~see~~ Lakein ~~dense~~ dense brake of dwarf
bamboo (*Pleioblastus*)

3 03

~~*Asplenium*~~very common under
bamboo (also seen in
forest below)

2 04

Pleioblastus

dominant on summit

5 05

Ilex fobergiana Hu*Ilex*occasional in ~~summit of Omoto~~
cane - ~~lake~~ Jun 9, 1956

2 06

Schefflera odorata?

in "fox-hole" on summit Omoto

Stemodia hirsuta (Thunb.) Decaisne

SHIGISHI ISLAND.

57

shrub 2 m. tall,
flowers pale green.*Microsorium brownii* (Bal.) Ching?small tree, bark and leaves
highly aromatic; fruit immature

small tree, sterile,

(attacked by fungus #37401)

covering dead portions
of *Eurya* sp tree with
a silvery white coating,
giving an eerie impression
in wet shady forest.scandent shrub,
calyx lobe white, corolla
yellow.

520 m.

Polypodium brownii (Mett.) Tard. & G.

det. C. V. Morton

densely crowded,
forming a brake 2-4 m. tall,
canes orange color when
mature.stem scandent shrub or vine,
leaves conspicuously pellucid
reticulate beneath, aromatic.

June 9 - south ridges of
Omoto - ~~san~~ ^{Dake}
in thick low wet forest
(~~tree~~) *Hydrangea* (*longifolia*?) *Holm*
occasional

37407
3

3 08 *Hydrangea* *clanensis* *sup.* *Holm*
occasional

5 09 *Lindsaea* *sp.* *Holm*
occasional, climbing
on tree-trunks.

3 10 (~~tree?~~) *Styax* *japonica* *Sw.*
occasional

June 9 - gulches at
northeast base of Omoto ^{Dake}
11 *Maesa* *clanensis* *Mex*
common in second growth

June 9 - valley of Miyara-
gawa, 1 mile north of
Kainan Village

10 12 *Fraxinus* *diffusa* *Gr.* *Bl.*
in second growth thickets

2 13 *Vincetoxicum* *sp.* *Holm*
climbing in second-
growth thickets

5 14 *Ficus* *ampelae* *Burm.*
in second-growth thicket

15 *Buddleia* *sp.* *Holm*
in second-growth thicket

475 m. small tree 6 m. tall,
in bud only; leaves
glaucous beneath.
475 m. small tree 5 m. tall,
flowers green, sterile
flower greenish white

475 m.

475 m.

200 m.

shrub 1 m. tall, showing
a common abnormality.

100 m

tree 8 m. tall

vine twining in trees,
petals bronze with
greenish center,
corolla white.

small tree

small tree, leaves
glaucous beneath,
fruit immature.

June 10 -

(79) small mangrove swamp,
(Photo 945-24)
low scrubby growth
with considerable
open ~~and~~ sandy, gravelly
mud.

Excoecaria and
Rhizophora mucronata
most abundant, with
considerable *Bruguiera*
conjugata, some *Pumnitzia*
racemosa, and with
Acroderdendrum inerme
getting down into swamp.
Also *Vitex* (prostrate form).
Some open areas covered
by *Paspalum vaginatum*
others, less low and
wet, by *Panicum ambiguum*.
General height of
~~the rest of~~ woody
plants here is 2-3
m., with some *Excoecaria*
reaching 4 m.

(80)
(Photo 945-24)

second small
swamp toward
Nagara, at mouth
of small stream,
has principally
Bruguiera, with
some *Rhizophora*
especially toward
the sea.

borings yield a dark
gray shell and coral
sand, rather clayey
in places, elsewhere
gravelly.

General height of
woody plants here
about 2 m.

June 10 - mouth of
Nagura-gawa

(81)
(photo
945-24)

broad open flats
with no vegetation
except here and there
areas of sea-grass.

Areas of low mangrove
mostly *Rhizophora*,
some *Burquina*, a very
little *Avicennia* and
Sonneratia, also areas of *Paspalum vaginatum*.
None of this more than
2-3 m. tall.

Exposed chert or
schist rocks from
Limbristylis, *Hedyotis*,
etc.

(82)

Along river bank
a mixed forest of
Hibiscus, *Pongamia*,
Ficus, *Pandanus*,
Peritius, *Raphirolepis*,
Porteria, *Excoecaria*,
Premna, etc. festooned
with *Caesalpinia*, *Derris*,
Dalbergia vines.

This is dense, tangled
and penetrated with
difficulty. It merges
into the mangrove
swamp in places.

(83)

Back of this is an
open, grassy area,
varied with thickets.
Here the grass is principally
Ischaemum muticum,
with some *Imperata*.

June 10 - ~~3.5~~ 3.4 km. n.w. of
Nagura, along coast s. of

- 37416 *Paspalum vaginatum* Swartz
dominant in many
wet saline places, usually
submerged by high tide.

Shira Hama, at
June 10 - mouth of small
stream ~~2.7~~ 2.7 km. n.w. of
Nagura

in mangrove swamp on muddy
shell and coral marl.

- 17 *Bruguiera conjugata* (L.) Merr.
commonest species

~~June 10 - mouth of
Nagura - salt.~~

- 8 18 *Sunnitzera racemosa* (Sack) Vahl
occasional

June 10 - mouth of
Nagura + Gawa

- 7 19 *Ischaemum muticum* L.
abundant in low
open ground back of
river bank thickets.

- 2 20 *Fimbristylis cymosa* R.Br.
on chert boulder in river-mouth
mud flat

Kera
~~Mafum~~ Laki

1 m.

culms ascending; forming
a loose sod.

0 m.

shrub 2 m. tall, with
closely crowded prop
roots and small
"knees" or loops of root
protruding above the mud;
flowers with calyx
red, petals dull orange.

shrub 1.5 m. tall; leaves
fleshy-coriaceous;
flowers white.

1-2 m.

rhizome prostrate, on
surface of ground,
fruiting culms erect.

caespitose

1956 Ryukyu Is.

37421

Caesalpinia

4

common in riverbank ~~thicket~~

3

22

Zostera japonica Aschers. & Gr. det. C. den Hartog 1969

0 m.

forming a thin sod on sandy mud-flat exposed at very low tides

5

23

Pouteria

occasional in river-bank thicket.

5

24

Catharanthus roseus (L.) G. Don
large colony in open area
back of riverbank thicket

5

25

*Avicennia officinalis*local in edge of
mangrove swamp

3

26

Raphiophis (L.) Nakai
occasional in
river-bank thicket.

3

27

Ficus superba Wray
common in riverbank
thicket

woody climber.

1 m.

shrub 2.5 m. tall.

2 m.

flowers magenta.

0 m.

shrub to 2 m. tall,
flowers orange, on
spreading lower branches.
~~shrub~~ 2.5 m.
tall.

1 m.

small tree, almost
deciduous, at this
season, fruits pink to
purplish.

June 11 - Miyara River
3 km. n.w. of Miyara

(84)
(photo 940-26)
trifoliate
secondary
tree.

Thickets and woods
along river on banks
and limestone bluffs.

Hibiscus tiliaceus and
several species of Ficus,
Melia, Pterocarpus, Cordia,
a tall bamboo, Ochroma,
Melanolepis, and a number
of other trees, tangled
and festooned with
Caesalpinia 2 spp., Clematis,
Ipomoea, Ampelopsis,
Canavalia, Clerodendrum
inermis, Wedelia biflora
and other vines and scrambling
shrubs. Flagellaria, Smilax, ~~Dioscorea~~
Dioscorea.

The ground, in many
open places, is grass
covered, especially Oplismenus,
in more shaded
places, fern covered, by
Thelypteris.

June 11 - 3 km. n.n.w. of
Miyara

(85)

Outcrop of volcanic rock
covered by grove of small
pines, periphery by
Imperata. Under pines
growth is sparse, with
Rilium, Aneilema, Vernonia,
Elephantopus, Polygonum,
Commelina, Oplismenus,
Desmodium, Osbeckia,
Clematis, Viola, Oxalis,
several other weeds, most
of them quite underdeveloped.
Ground mostly covered by
pine needles.

June 11 - 0.7 km. e. of
4 km. n. of Miyara

(86)

Outcrop of thinly bedded
schist. Covered by sparse,
recently burned Imperata,
with considerable
Andropogon, various
other grassland species,
as Wahlenbergia, etc.
in small amounts.

June 11 - 1.5 km.
north of Miyama

87

dissected limestone roughly aligned in parallel short ridges and rows of rough outcrops, some with furrows or very shallow ravines between them, more commonly with elongate cultivated patches between them. Where there are cultivated patches the ridges are accentuated by throwing of coral picked up in the patches on the ridges.

Where not cultivated the spaces between the ridges are covered by *Imperata* with many associated species. *Rosa* and *Psidium* are very conspicuous.

Setaria, *Thesmodia*, *Paspalum*, *obiculare*, *Fimbristylis*, *Lygodium*, *Labiates*, *Lespedeza cuneata*, *Centella*, *Elephantopus* are all common.

Ridges vary from almost bare to bushy. Usually some *Miscanthus*, *Ficus*, *Ampelopsis*, *Polytheda*, *On larger ones Pandanus*, *Toddalia*, *Morus*, *Pipturus*, *Arenga*, *Allophylus*, *Smilax*, *Lygodium*, *Thelypteris*, *Broussonetia*, *Crataeva*, etc.

88

Patch of woods of *Ficus* 2-3 spp., *Fibrous*, *tiliaceus*, *Morus*, *Rhus*, *Pipturus*, *Melia*, etc. *Melaleuca*, *Pterocarpus*, forming a fair canopy, tangled with *Ipomoea*, *Smilax*, etc. *Lygodium*, *Flagellaria*, *Clematis*, thick undergrowth of *Andisia*, *Psychotria*, *Damnacanthus*, *Alocasia*, *Boehmeria*, *Eurotia*.

89

Across road is outcropping of coarse limestone.

June 11 - 1.5 km. n. of Miyara,
s. of Miyara, Makinaka
in grass on shallow soil
between limestone outcrops.

- 37428 (~~det.~~) *occasional*
3 29 *Fimbristylis* *occasional*
3 30 *Fimbristylis* *occasional*
5 31 *Theseda japonica*
locally common

- 2 32 same - cultivated field
Duchesnea indica
weed in cultivated
field, in full sun.

- 3 33 same - on rough limestone outcrops
Polypodium scolopendria *common*

- 2 34 *Thelypteris*
common

- 2 35 *Randia*
occasional

- 2 36 *Broussonetia papyrifera* (L.) L'Hér.
occasional

- 2 37 *Crataeva*
rare

- 4 38 *Allophylus*
rare

- 3 39 *Polygonum*
common

65-80 m.
↓

flowers ^{with lip} deep pink, tube white.

culms single or in
tufts of 2 or 3.
culms single, ~~erect~~ erect
from prostrate base
on stilt roots.

prostrate; petals yellow.

fronds erect.

shrub, fruit immature
branches rigidly decussate.
shrub, sterile.

shrub, sterile.

shrub, flowers white

extensive scrambling
herb, flowers white.
~~creeping~~ prostrate stems
rooting at tips.

37440 *Phascelus*
occasional

same - in patch of
dense tangled woods

- 1 41 *Morus*
common
- 2 42 *Muraya paniculata* (L.) Jack.
occasional, edge of wood
- 5 43 *Randia*
very common in undergrowth
- 2 44 *Psychotria*
common in undergrowth

~~25~~

Akashita,
June 11 - bridge over
Miyara River, 3 km.
n.w. of Miyara
in old quarry in
argillaceous limestone

- 5 45 *Nephrolepis exaltata* (L.) Schott
abundant
- 5 46 *Pteris*
common
- 5 47 (grass) *Pogonatherum*
common
- 1 48 *Euphorbia*
occasional
- 5 49 *Wedelia biflora*
common
- 4 50 *Melanolepis multiglandulosa*
common

in thicket on side of
road cut

flowers yellow,
keel twisted.

80 m.

tree 6 m. tall, spreading.

shrub 1.5 m. tall;
flowers white.

shrub 2.5 m. tall.

shrub.

20 m.

fronds erect.

fronds ascending

erect, tip arching,
flowers white.

spreading herb,
flowers yellow.

- same - in river terrace forest, limestone soil
- 37451 ~~bambo.~~
2 common
- 5 52 *Ageratum houstonianum* ^{Mill.}
occasional in small opening.
- 5 53 *Orchid* ~~small~~ ^{anyone} ~~growing~~
small colony in grass under trees
- 5 54 *Erodia*
common in understory
- 5 55 *Erodia*
common in understory
- 5 56 *Oplismenus compositus*
carpeting ground under trees
- 5 57 *Cordia* ~~distichum~~ ^{T. & G.}
common
- 5 58 (~~sp?~~) ~~distichum~~ ^{sp. from Ryukyu}
occasional
- 1 59 *Mucuna urens*
rare

June 11 - 0.7 km. e. of Kawahara,
4 km. n. of Miyako
grassy schist outcrop

15 m.

- culms scattered, green, erect, 8 m. tall.
- ~~flower~~ sprawling branched herb, flowers mauve blue.
- 53 erect from ~~depressed~~ globose ~~growing~~ ^{erect} corm, sepals and 2 petals green, lip white with purple lateral veins.
- 54 shrub 2 m. tall, ♂
- 55 shrub 2 m. tall ♀
- 56 stems prostrate fruiting culms ascending
- 57 tree 5 m. tall, almost leafless at this season; fruits green.
- 58 woody vine, catkins greenish.
- 59 pods hanging on dead vine.

40 m.

1956 Ryukyu Is.

June 11 - 3.3 km. n.w. of
Miyara, 0.5 km. n.e. of Akashita
in small grove of pines
on volcanic outcrop

37461

Lilium longifolium
common

5

June 12 - 2 km. s.e. of
Dacho-zaki to 2.2 km. e. of
Dacho-zaki

Smooth grassy hills,
rather closely grazed.
Grass mainly *Imperata*,
with much *Pteridium*
of small size, fronds
not more than 3(-4) dm.
long. Many herbs
such as *Evolvulus*,

Blumea, *Gynura*,
peculiar lythraceous one,
Thelypteris, etc.

Scattered fairly large
spreading pines.

These mostly show
fire scars and charring
on lower part of bark.

Undoubtedly the area has
been burned not long ago.

Patches of *Alpinia speciosa*
on upper slopes.

bulb scales bright yellow,
white within.

June 12 - 2 km. s.e. of

Dacho-zaki to 2.2 km. e. of

Dacho-zaki

Smooth grassy hills,

rather closely grazed.

Grass mainly *Imperata*,

with much *Pteridium*

of small size, fronds

not more than 3(-4) dm.

long. Many herbs

such as *Evolvulus*,

Blumea, *Gynura*,

peculiar lythraceous one,

Thelypteris, etc.

Scattered fairly large

spreading pines.

These mostly show

fire scars and charring

on lower part of bark.

Undoubtedly the area has

been burned not long ago.

[illegible]

45 In head of the
wooded bay, a
considerable colony of
river terns - many of them
from small swallows to
the size of the terns - all
kept to the water but with
a strong tendency to
cultivate the open water
all between the bay and
the open long, straight
road - appeared to be
have lost their influence
no new ones seen

96 On some ^{south} slopes the vegetation is
a mixed scrub.

97 High place with steep E
side covered with large
boulders in places.

945-34

(105)

Rivine

on north peninsula.
 on grassy slopes and low
 hills with scattered pines
 in deep grass.
 common locally in low ground
 in deep grass.

Ehretia

June 12 - 2 km. s.e. of ^{Kura}~~Dadifu Saki~~
 on north peninsula.

on grassy slopes and low
 hills with scattered pines

37462

Melastoma

5

common locally in low ground
 in deep grass.

2

63

(~~leaves~~) common in low wooded ravines

4

64 *Ehretia dicksonii* var. *japonica* Nak.
 common in low wooded ravine

ridge s. of Kura Dake

~~same~~ - upper edges
 of forest along crests
 of ridges

2

65

Hibiscus

2

66

Hibiscus ~~mutabilis~~
 rare

5

67

Eurya
 common

6

68

Pinus luchuensis Mayr.
 abundant, dominant
 locally, scatters elsewhere

35 m.

flowers rose pink.

small tree; leaves
 somewhat glaucous
 beneath, old inflorescence
 red.

small tree, fruit greenish
 yellow.

150 m

shrub 2 m. tall
 shrub 2 m. tall

shrub 1.5 m. tall,
 fruit immature
 spreading tree 10 m.
 tall, 3 dm. dbh.

- 37469 *Viburnum awabuki* K. Koch
common
6
70 *Scavola* ~~sp~~ *sericea* var.
rare on brink of cliff
in open grassy nose
3 71 *Ficus foveolata* var. *thunbergii*
local, clinging to rocks
in edge of pine ~~forest~~

Kura Dake,

June 12 - 2-2.2 km. e. of
Dachozaki Dadifu Saki
in dense moist forest
9 72 *Asplenium*
abundant in bottom
of moist ravine cut in
Schist

- 5 73 *Alpinia*
common

- 4 74 *Lonicera japonica* Kunth
occasional
det T. 2000 1/29

- 2 75 orchid ~~climber~~ ~~poisonous~~
occasional, terrestrial

- 2 76 *Schefflera odorata*
rare

- 150' - small tree 6 m. tall;
fruit red, not quite mature.
- shrub 1.5 m. tall
flowers white with
purple veins.
(Maxim.) King - vine, clinging to
rock but with
erect branches, also
with characteristic
witches brooms; sterile.

200-250 m

dark green, fertile
fronds erect, sterile
spreading.

- rhizome aromatic,
stems ascending.
fruit immature, smooth.
extensive climbing
stem from a hard
tuberous rhizome;
- fruit immature
~~flowers~~ leaves a dull
translucent grayish
green; flowers white
with ~~a~~ a bright
orange spot in middle
of lip.
- sterile woody vine,
leaves with conspicuous
reticulate venation beneath.

June 13 - s.w. base of Banna-dake
on weedy roadside

37477 *Crotalaria* ~~occasional~~
occasional

5 78 *Paspalum conjugatum* Berg.
abundant

3 79 *Ipomoea pes-caprae* var. *brasiliana*
several plants seen

1 80 *Artemisia* ~~capillaris~~ *Thunbergii*
common

1 81 *Wedelia* ~~indica~~ *(indica)* *DC.*
common

5 82 *Vincetoxicum*
occasional in thicket

3 83 *Melochia corchorifolia*?
common

1 84 *Hedyotis*
rare

5 85 ~~*Distylium racemosum*~~
common in thickets

5 86 *Ageratum conyzoides* L.
common

1 87 *Lysimachia mauritiana* Lam.
occasional

erect much-branched herb
1 m. tall, flowers bright
yellow with dark brown
spot at base of wing.

erect culms from
creeping superficial
rhizomes.

prostrate, flowers
bright purple collapsing
about 4 p.m.

erect herb, odor not
very strong.

prostrate, flowering
stems ascending,
flowers yellow (rare at
this season)

milky herbaceous
vine, flowers with
corolla lobes reddish
with green centers,

corolla white; pods green,
flowers pale lavender.

flowers white.

shrub 2 m. tall,
flowers white.

erect strong smelling
herb; flowers white,
leaves fleshy, flowers
white.

s. w. base of Banna-lake
small shrine with
no forest around it.

(106)

(photo
940-8)

The gently sloping
land at the foot of the
mountain is covered
by an irregular mixture
of thickets and grassy
or weedy patches. The
thickets are mainly
Acacia confusa, probably
planted, and pine, perhaps
planted. The younger
thickets have consider-
able ground cover of ferns,
etc. Older ones have very
little. Mixed with the
planted trees are native
ones, such as *Ficus*,
Distylium, etc. Some
Miscanthus here and
there in edges and thin

spots. The small
road is lined with
weeds, dominantly
Laspadium conjugatum
and *Imperata*, but
many other species.

(107)

The slopes above, examined
with binoculars, are
semi-open, with
bushes and grass,
mostly *Miscanthus*
in most places.

Acacia confusa goes
well up the slopes.

June 15 - ^{shot} southeast of
Hirai

Photo
447-8

- (108) Beach ridge with scrub
of *Scaevola*, *Premna*,
Plandanus, *Miscanthus*,
Hibiscus, *Vitex*, *Messerschmidia*,
Wikstroemia, *Clerodendrum* incense,
mostly closed, varying from
~~1.5~~ 2 (or even 3) m. in height.

A little
guettarda
ferminalis
cassipoupa
Wedelia
Fimbristylis

- (110) From the front of the ridge
a rough but abraded limestone
platform protrudes about
20-25 m., about 3 m. above
a well developed erosion ramp,
this notably abraded and
with an accumulation of
well rounded cobbles and
pebbles at top and scattered
in pits and foot holes on it.
Platform in places undercut
as much as 2 m. the ramp very
well abraded, elsewhere not
undercut, fringed by a pebble
or cobble beach. Ramp about 1 m. high.
In undercut places fresh
water dripping from ceiling
(heavy rain yesterday and
last night).

Locally some patches of
sandy beach. Here are
scattered *Ipomoea pes-caprae*,
Euphorbia chamissonis.

Thunaea
Asparagus
Premna
cassipoupa
Lilium
Wedelia
Fimbristylis

Lepturus, *repens*, etc.

On the top of the platform
the relief is about 1 m.,
generally. The vegetation
is a mixture of *Zoysia tenuifolia*,
Pennisetum (very prostrate),
Carmona (very prostrate),
Hedyotis, *Lepturus*, *Indigofera*,
Linum (?), and patches
of low bushes of *Hibiscus*,
Messerschmidia, *Scaevola*,
Cinnamomum, *Vitex*, *Euphorbia*, *Artemisia*, etc.
The cover is rather full
but in places there is
considerable limestone
showing.

- (111) Large stretch of beach
on photo has been somewhat
eroded, exposing patches
of the platform and
large areas of pebbles
and cobbles. This
has scattered tufts of
Euphorbia, *Lepturus*, *Messer-*
schmidia (very small
bushes, *Scaevola* seedling,
etc. Some *Thunaea*.
The sand is being
excavated and hauled off.

(109)

plain back of beach ridge where coral is very close to surface and is exposed here and there. Some small areas of this are cultivated. Mostly it is in grass, chiefly *Imperata*.

Close to the beach ridge there are scattered bushes of *Decasura*, *Premna*, *Vitex*, etc. especially on limestone outcrops.

Away from the ridge there are more and more replaced by *Psidium*, *Rosa*, *Osteodermis* (?), *Raphirolepis*, *Ampelopsis*, *Rubus*, *Callicarpa*, etc.

Many herbs, especially *Evolvulus*, *Lespedeza*, *Desmodium*, *Leucas*, etc. in grass.

Farther away from beach *Psidium* becomes very abundant in grass. In places it may form half the cover.

Patches of *Agave americana* are occasional. Cycads are not common here but are found.

June 5 Ohama - mouth of inlet

(112)
(Photo 8-17-46)
thick forest on rough limestone. Mixture of *Pithecellobium*, *Ficus*, *Artocarpus*, *Broussonetia*, *Pandanus*, *Pouteria*, *Muraya*, *Mallotus*, *Carmona*, away from sea, *Macaranga*, *Ficus* sp., *Melanolepis*, *Erythrina*.

Enormous orb-weaving spiders with leg spread of 18 cm. or more. Several colors, very small males or else another species, not more than 1.5 cm. across commensal in same web. Large overeating scarabs.

Interrupted inland by small patches of garden between outcrops. Trees get taller inland. Varies from about 2 m. on outer edge to even 8 m. inland. Some *Calophyllum*, *Casuarina* and *Acacia* inland, perhaps planted.

This whole forest very dense and tangled with vines, *Ampelopsis*, *Caesalpinia*, *Clematis*, *Polygonum*, *Toddalia*, *Vitis*,

(113)

On west side of inlet is well developed beach rock with seeps of fresh water trickling down over it and seeping out of it. Maximum thickness seen about 0.3 m.

Mostly rather fine grained ~~Maximum thickness~~

Upper parts rather pitted lower parts in places broken up. Some loose beach sand locally.

A *Phyllanthus*-like shrub but leaves not distichous, common at base of cliffs and on upper part of beach, with *Hibiscus*, *Clerodendrum*, various grasses, etc.

On limestone bluff is scrub of *Hibiscus*, *Pandanus*, *Arenga*, *Erythrina*, *Pipturus*, *Ficus*, etc. *Pittosporum*, *Ligustrum*, *Cannona*, *Raphriolepis*, *Premna*, *Garcinia*.

Dense tangled, 2-4 m. high.

Pandanus and *Hibiscus* are most abundant.

On eroded beach rock well below high tide level, *Limonium* (?) *Zoysia*, etc. grow abundantly in pits and crevices. Above this, especially on sandy spots, *Ipomoea pes-caprae* and *Zoysia tenuifolia*, *Euphorbia chammissonis*, etc. are abundant.

114

East of Ohama along shore is rather extensive beach scrub of *Scaevola*, *Hibiscus*, *Pandanus*, *Premna*, etc. *Clerodendrum*, etc. The shore here is low and shelving, composed of a mixture of sand and coral gravel, occasional outcrops of post-miocene limestone some of them huge boulders or remnants. The sandy and gravelly flats here where not covered by beach scrub, are grassy, with *Sporobolus virginicus* below high tide level, several other halophytes, *Zoysia tenuifolia* and *Ipomoea pes-caprae* in patches above

high tide.

In large limestone boulders ~~is~~ is a sparse scrub of *Premna*, *Pittosporum*, *Casimiroa*, *Licium*, *Persea*, *Messerschmidia*, *Raphiolepis*, ~~with~~ *Lepturus*, *Zoysia tenuifolia*, *Hedyotis*, etc.

June 15 - Between Miyara and Shiraharu

(114) Wide coral plain between road and coast, very little of it in cultivation, mostly in pasture.

The half nearest the road is a mixture of *Imperata* with *Miscanthus* probably *M. sinensis*, judging by the very narrow leaves. The soil is thin and scab-like. Outcroppings of the rough limestone are frequent. Many herbs and considerable *Psidium* mixed with the grass. Large areas have broken coral rock in pebble sizes instead of soil. A few small clumps of *Cycas*.

115

116 Toward the sea the *Miscanthus* drops out and *Imperata* and *Setaria* are the abundant grasses. ~~The~~ *Psidium* is frequent. *Rosa*, also. Many herbs and a few shrubs are mixed in.

Principal herbs seen are:

Lespedeza cuneata
Artemisia
Galium
Euphorbia hirta
Senecio
Panicum reptans
Conyza bonariensis
Emilia sonchifolia
Fimbristylis monostachya
Centella asiatica
Vernonia cinerea
Desmodium spp.
Phaseolus

June 15 - just east of Shiraharu-saki

119

The shore here is peculiar. There is an erosion ramp about 50 m. wide, pitted and covered by solution basins. ^{Little or no abrasion evident.} *Desmodium* is abundant here, below high tide level. A little

Sesuvium with it.

118

Heavily
grazed

Behind this is a flat about 30 m. wide, of a veneer of sand creased by a dense stand of *Zoysia tenuifolia* with a few miscellaneous herbs. Many young *Messerschmidia* along landward margin.

117

Then a broad boulder-cobble ridge covered by a low beach scrub of *Messerschmidia*, *Pandanus*, *Clerodendrum*, *Leucola*, with *Thunbergia*, *Vitex*, *Zoysia*, etc. in openings.

On grassy flat back of boulder ridge ³⁰⁰ ~~100~~ m or more from sea are many large pieces of pumice lying on the ground, on rough coral.

Here the rough limestone outcrops are arranged somewhat in rows, rather zigzag, perpendicular to the coast.

120

June 15 just west of Shurahi
band of low tangled bushy vegetation on limestone. A mixture of *Pandanus*, *Cycas*, *Alpinia speciosa*, *Miscanthus*, *Toddalia*, *Carmona*, *Calophyllum*, *Albophyllum*, *Premna*, *Psidium*, *Munroa*, *Mallotus*, *Ficus*, etc.

This is tangled with *Ampelopsis*, *Wedelia*, and *Clematis*.

This is mostly 2-3 m. tall, but where there is much *Calophyllum* it may be 5-6 m.

Here and there patches are cleared in this and planted to 2 varieties of *Sorghum* and *Luffa* (?).

June 15 - ~~Miyazaki~~ 1 km. e.
of Miyazaki

in grassland on soil
between outcrops of
rough limestone.

37488

~~Portulaca~~

3

occasional

2

89 *Vernonia cinerea* L.
common

2

90 *Conyza bonariensis*
common

1

91 (rubl) *Conyza bonariensis* L.
rare

1

92 *Wahlenbergia* (Forsk.) A. N. S.
occasional

June 15 - 1 km. ~~West~~ of Ohama,
on Miyazaki-Wan, near Isobe

3

93 *Portulaca* ~~occasional~~
occasional on sandy beach

3

94 *Lophora tomentosa* L.
rare on limestone boulders

3

95 *Pemphis acidula* Forst. f.
occasional on limestone

5

96 *Ficus vetusa* (Thunb.) Hook. & G.
occasional on rough
limestone boulders

7

97 *Lesuvium portulacastrum* (L.) L.
salt flat, inundated
by high tide

37488a *Scaevola taccada*
(Gaertn.) R. Br.

erect, flowers yellow.

flowers purplish.

small plants flowering,
larger ones not yet.

flowers bluish violet.

1 m.

prostrate, flowers white.

small shrub

depressed shrub,
flowers white.

depressed shrub,
figs purplish.

prostrate, very fleshy,
stems greenish with
reddish nodes, leaves
green, glossy, compressed,
flowers pink.

37498 *Suaeda* ^{multicaulis (L.) Moq}
5 local on saline flat,
inundated by high tide

2 99 *Galium*
on rough limestone ~~on~~ in
edges of brush.

37500 *Sporobolus virginicus* L.
2 dominant on sand flats
below ~~high~~ tide level.

June 15 - just east of
Ohama, on Miyara Wan

2 01 *Limonium* ^{rubrum (L.) Moench}
abundant on rough
limestone below high tide level.

5 02 *Ligustrum* ^{japonicum Thunb.}
common on low limestone
bluffs above beach

5 03 *Phyllanthus* ?
common at top of beach

6 04 *Solanum* ^{verrucosum L.}
rare in scrub on rough
limestone

6 05 *Polystichum* ^{latifolium (L.) Presl}
on shaded limestone cliff

June 15 - Tada Hama,
on coast s.e. of Hirai

on sandy beach, ridge

2 06 *Digitaria*
occasional

5 07 *Leaevola sericea* Vahl
very common in beach scrub

erect, very fleshy.

dwarf shrub, mostly
sterile, a few in bud.

2 shrub 1-1.5 m. tall,
fruits very immature.

shrubs 1 m. tall

4 shrub 2 m. tall; flowers
white, ripe fruit yellow.

1-3 m.

1 culms spreading

2-3 m. 17 shrub 1.5 m. tall;
flowers white, fruit white.

- 37508 *Allophylus* ~~littoralis~~ ^{occasional} in beach ridge scrub.
- 2 09 *Scaevola sericea* var. common in beach ridge scrub.
- 6 10 *Ipomoea* ^{*littoralis* Bl.} common at edges of beach ridge scrub.
- 5 11 *Chenopodium* ^{*serotinum* Willd.} common on sandy patches on limestone terrace just above sea.
- 2 12 *Indigofera* ^{*littoralis* Merr.} common on rough limestone just above sea.
- 2 13 *Cassytha filiformis* occasional, parasitic on various plants on rough limestone near sea.
- 1 14 *Lepturus repens* (Forst.) R. Br. very common on rough limestone near sea.
- 2 15 *Artemisia* ^{*capillaris* Thunb.} common on rough limestone near sea.
- 5 16 *Leucas* common on rough limestone near sea.
- 2 17 *Lotus* ^{*coronatus* L.} occasional on rough limestone.

Yuriga Harma,
June 15 - 1 km. e. s. e. of Miyara
on coast.

- 1 18 *Pilea* ^{*polystachya* H. & A.} on rough limestone at top of beach, in

shrub 1 m. tall.

shrub 1 m. tall, flowers
— purplish, fruit white.
prostrate, flowers
— rose purple, darker
in throat.
erect

prostrate, flowers red;
pods quadrangular.

Twining yellow stems.

flowers white.

prostrate, flowers
white

1 m.

stem fleshy.
in pits and crevices.

June 16 - north of Ozata
east of Kara-lake

(121
Photo
950-4)

Scattered pines on
grassland on schist
gullies either grassy or
filled with Pandanus scrub.
Some admixture of miscellaneous
shrubs and small trees.

- 122 Eocene limestone area
~~covered by~~; where it is
not much dissected -
covered by a thick forest
of Ficus, Diospyros,
Ardisia, etc. scarcely
any undergrowth except
tangled bases of lianes.
Scattered second story
trees.

Canopy irregular
6-10 m. Mainly Ficus
and Diospyros, but
occasional Melanolepis
and Macaranga, Garcinia.
Ardisia, Viburnum and
small Diospyros in
second story.

Lianas are Smilax,
Piper, Clematis, Clematis, Cypripedium
spiny Randia, Pisonia aculeata

Almost nothing
on ground except a
few creeping Piper vines.
Much bare angular
rock exposed, mostly
limestone but some of
it rather sandy.
Some Alocasia, and
very few ferns.

Locally ^{in central part of forest} several other
trees. Pisonia aculeata
very commonly climbing
through trees. ~~Fruit~~ fallen
fruit abundant on
ground and hanging
in trees. Arenga common
generally.

123

In ~~some~~ ^{central} part are
enormous jointed
castle-like blocks of
limestone, simulating
human construction.
Banyan roots enveloping
many of these.

124

The higher parts
of the forest are
perhaps 15-20 m. and
are principally enormous
banyans. Under them
are Diospyros, Garcinia,
Murraya ^{sparsely} ~~laced~~ with
Smilax, Flagellaria, etc.

Working gradually seaward and downward over a series of escarpments, encountered more and more post-Miocene limestone, but never completely ~~lost~~ left the Eocene limestone. Finally, at the same time, there were quantities of large pumice cobbles and Hibiscus and Hernandia became common, then dominant. To these Diospyros and Ficus, with some Cordia and Garcinia had made up the greater part of the forest.

(125) The marginal 100 m. or so are a solid, somewhat windbeaten, stand of Hibiscus and Hernandia with some Pandanus.

At the top of the beach is a belt of Viter, Ipomoea pes-caprae, Clerodendrum and small bushes.

The inner edge of the reef flat is littered with a great abundance of large boulders, up to 2 m. or more in diameter. Most of these are post-Miocene limestone, a few

are Eocene.

126

At the mouth of the southernmost dry inlet are some fine Eocene boulders out in open similar to those in forest. Also a contact, vertical(?) between Eocene and post-Miocene. The contact is in the bottom of the inlet with Eocene much higher on south side of inlet.

Trees & shrubs at top of beach - Calophyllum, Clerodendrum, Wilkesia, Terminalia catappa, Thespesia, Messerschmidia, Dodonaea, Lophos, Colubrina, Guettarda. All except the first 3 and Messerschmidia are rather scarce.

Scaevola seen only on the north end, within a ~~few~~ couple of hundred meters of the stream mouth.

127

m.
1-2 m. tall

Along the stream is a clearing that is filled with ^{low} old-field scrub, + grass. Viter, Dodonaea, Scaevola, Pandanus, Fraxinus?

128

A small patch of Bruguiera in stream above bridge. Below bridge stream is lined

with *Excoecaria*. Back
of this is a scrubby
mixture of *Erythrina*,
Ficus, *Cerbera*,
Leucaena, *Ehretia*,
Dodonaea, and *Pandanus*.
Clerodendrum sp. var.,
Cassia, *Sida* sp.,
Alpinia speciosa,
Calophyllum lucidum,
Fraxinus? *Heinandia*, etc.
3-5 m. tall.

n.e. of Ozato,
June 16 - coast east of
~~Kana-dake~~ south of mouth
of Toro gawa.

on sand flat at top of beach

- 37519 ~~(37519)~~ *Pongamia pinnata* var. *angustifolia* (L.) Merr.
rare
3 20 *Quettarda speciosa* L.
rare in edge of forest.
5 21 *Wedelia* (L.) Merr.
local in grassy area
6 22 *Allophylus* (L.) Merr.
rare in edge of forest
3 23 *Colubrina asiatica* (L.) Brongn.
rare at edge of forest
3 24 *Dodonaea viscosa* (L.) Jacq.
rare at edge of forest
1 25 *Ipomoea* (L.) Merr.
rare and local

June 16 - s.w. base of
Banna-dake
Rice field weeds - *Ageratum*
conyzoides, *Eclipta alba*,
Hypericum sp., *Marsilea* sp.,
Lindernia sp.,
Anthriscum hispidum,
Centella asiatica,
Cynilia sonchifolia,
Panicum repens,
Echinochloa crus-galli,
Monochoria vaginalis,
Polygonum sp.

2 m.

(Wight) Wedd.

fruits red, fluted.

shrub 2 m. tall.

very prostrate,

flowers yellow.

shrub 1.5 m. tall, buds

white, fruits not quite mature.

shrub 1 m. tall, sterile.

shrub 1.5 m. tall, sterile.

prostrate, flower white.

37526

Ilex

common on bare sand

1

27

Ilex

common on bare sand

1

2

28

Chenopodium

occasional on bare sand

2

29

Lepturus repens var.

occasional

30

~~(illab.) Cassia~~

occasional at edge of forest

31

same - at about high tide level
on pitted large limestone boulders
on lower part of beach

5

31

~~(illab.)~~

common

32

32

Limonium

common

1

June 14 - terraces ^{n.e. of} ~~Kanadake~~ Ozato
in dense forest on
dissected Eocene limestone

2

33

Damnacanthus

rare

6

34

Premna

common locally

1

35

~~And~~ *Mucuna*

common locally

rhizome buried, running,
flowers yellow.rhizome buried, running,
leaf blades flat on
surface of sand. flowers yellow.
erect

tufted

shrub 1.5 m. tall

1 m.

forming dense mats
and cushions; fruits
red.

dwarf shrub, buds only.

10-20 m.

~~tree~~ very small shrub,
sterile.tree 8 m. tall, flowers
pale green, ripe fruit black.~~(seeds fished up)~~
vine climbing in tops of
trees (seeds fished up
on ground beneath).

116

1956 Ryukyu Is.

37536 (enph.) *Mallotus* sp. *prostratus* (L.) Benth.

10

rare

5 37 *Pisonia aculeata* L.
common3 38 *Boehmeria* *sp.*
rare3 39 *Lysimachia* *sp.*
local3 40 *Randia* *sp.*
common5 41 *Viburnum* *sp.*
rare5 42 *Ficus konishii* Hayata
commonFeb. 7 - north of mouth of
Todoroki-gawa5 43 *Scaevola* *sp.*
common on sand ridge
back of beach

Ishigaki I.

117

small tree 6 m. tall;
fruit red.
— scrambling vine
climbing in tree tops,
~~leaves and~~ spiny
a - 1 spinelless, not
certain if different
plants or branches of same,
2 spiny branches may
be from different plants,
fruits picked up on ground.
— herb 1 m. tall.

flowers yellow

— scrambling ~~as~~ shrub
with tendency to
produce rigid short
branches; fruit immature.
— small tree, 4 m. tall,
fruits immature.
— tree with large
buttresses at base of
trunk, fruits on small
branchlets coming out of
trunk and large limbs.

4 m.

— rounded densely branched
bush; leaves glossy,
fruits green, glandular.

June 17 - Ishigaki City -

Cultivated plants observed:

Trees: *Garcinia spicata**Calophyllum inophyllum**Morus* sp.*Prunus persica**Carica papaya*2. *Cocos nucifera*2. *Areca cathecu**Ficus retusa**Casuarina equisetifolia**Podocarpus macrophyllus**Ehretia**Citrus**Melia**Livistona**Hernandia**Delonix regia*

Erythrina
Hibiscus
tiliaceus
H. schroyer

shrubs: *Codiaeum variegatum**Cycas revoluta**Hibiscus* (anamental hybrid)*Rosa**Cordyline**Polyscias quinifolia**Bougainvillea**Acalypha*garden plants: *Luffa* sp.?*Xanthoroma sagittata**Musa**Crimson**Luffa**Cucurbita*

Shrine forest:

Calophyllum inophyllum - large, 300 yrs.*Casuarina equisetifolia**Ficus retusa**Ficus**Hernandia*

June 13 - Taketomi, shore
near pier -
narrow sandy beach
backed by a low sea wall.
Back of the wall is a
narrow strip of
scrub.

Between the pier and
Hayama is agricultural
land. It is merely
the accumulated soil
between closely spaced
outcroppings of rough
limestone. On these, and
even on piles and fences of
rock picked up from the fields,
Cycas is very abundant.

In the small fields or
plots sugar cane, sesame,
~~many beans~~ sweet potatoes
and millet were observed.

Acacia confusa (~~not~~ *szechuanensis*)
planted for typhoon protection
and for wood.

Hayama Village:

Rosa sp., *Chrysanthemum* sp.,
Asclepias curassavica,
Catharanthus roseus, *Canna*
hybrid, *Codiaeum variegatum*,
Zephryanthus rosea,
Sarcocolla, *Podocarpus*, *Morus*,
Garcinia, *Gladiolus* sp. Planted in one yard

Hayama Village -
The streets are lined
with *Garcinia*, *Morus*,
Podocarpus, *Erythrina*, *Leiviston*,
Cordia.
Morus used in sericulture.
Garcinia used for house construction.

Island is 2.5 ~~mi~~ ^{around.} *ri* (1 *ri* = 4000m).
223 families on island, 1100 pop.
88 cattle and some goats.

Nishito shrine -

Ficus satsuma
Pouteria
Melanolepis
Ficus gibbosa
Garcinia

monument to grave of
Nishito, historical figure
who worked on Okinawa
in construction of Shuri Castle.
grave is here. Old shrine
was replaced in 1953.
Some stones said to have
been brought from Okinawa.

Hayama.

Tower on paleozoic outcrop
about 10-12 m. above surrounding
country. General aspect
of country from here is
wooded, but this due
to wind breaks or hedges
mainly of *Acacia confusa*.

Sei mei Otaki

Calophyllum (Yanabu)

Garcinia

Melanolepis

~~Ficus retusa~~

Pongamia or V. terocarpus

Pouteria

Ternstroemia

Laurac.?

Ficus (large lf. depressed fr.)

Kumihata Otaki

Garcinia (fukugui)
(anamous)

Pouteria

Ficus retusa

Laurac.? (tabu) (bark used
for incense)

Arenga

Diospyros

Pisonia aculeata (vine)

Murraya

Kohamato Otaki

Laurac. (tabu)

Garcinia

Pouteria

Diospyros

Melanolepis

Ficus gibbosa

Ficus retusa

Livistona

Alocasia very abundant

Large rock outcrop

Portulaca pilosa
(giroba gusa) brought
in by a person named
giroba. Has become a pest.Artemisia (native) juice
used for stomach aches.
(nūpan (Y))

Phaseolus

"nyobu zu" used for
(green) (bean)bean sprouts. Taken on
long voyages for Trochus
where fish vegetables
otherwise unobtainable.

{ Carthage

"kinashii" (T) "inuchii" (I, O)
wood for construction

A few Areca, but not used.

Codiaeum, Acalypha amentacea,
Ipomoea erecta, Alternanthera
versicolor, Canna, Tagetes,
Rosa, Ficus retusa, Acacia
confusa, Erythrina, as
ornamentals around school.Piper sp. growing over
walls. Young leaves used
cooked with rice. Ripe fruit
dried and used as pepper.

neither wet or dry rice cultivation on Taketomi. Soil is shallow. Water is short.

Even drinking water is a problem. When rains are plentiful some well water is used. Some rain is stored in cisterns. Otherwise water must be brought from Ishigaki.

Ramie is commonly cultivated, also mung beans, sweet potatoes, sugar cane. Black sugar like panela is produced. Bananas are common, especially around villages. When they are not destroyed by typhoons enough are produced to ship to Ishigaki.

Mr. Yonaguni, village chief, supplied most of the above information that could not be gained by superficial direct observation. He says there are some habu here.

Weeds in fields and along paths:

Euphorbia heterophylla
Bidens pilosa
Leptochloa orientalis
Lactaria sp.

Artemisia vulgaris
Solanum aculeatissimum

Sparganium angustifolium

Coryza canadensis

Euphorbia hirta

Coryza canadensis

Kalanchoe pinnata

Boehmeria nivea

Lonchocarpus

Digitaria

Verbena

Emilia sonchifolia

Cardiospermum

Cyperus rotundus

Echinochloa colona

Euphorbia hirta

Eleusine indica

Lynedrella nodiflora

Gynura

Imperata cylindrica

Artemisia

~~*Coryza*~~

Lactaria

~~(128)~~ on rock piles and outcrops between the fields. Cycas is generally common but more so at lower elevations. Higher, Musa sp., Miscanthus sp., etc. are also very common.

Shrubs toward east end.

- (129)
(Photo 865-25)
(nos 129-133)
- Garcinia
 - Ficus retusa
 - Laurus
 - Diospyros
 - Canis
 - Terminalia catappa
 - Podocarpus
 - Arenca (forming thick underground)
 - Melanolepis
 - Elaeagnus
 - Psychotria
 - Pouteria
 - Raphidophora

another farther east:

- (130)
- Diospyros, Garcinia
 - Melanolepis, Melia,
 - Murraya, Ficus
 - retusa, Broussonetia
 - Laurus, Canis
 - Raphidophora, Psychotria
 - undergrowth of Arenca
 - Pouteria, Elaeodendron,
 - Diospyros fovea? Hibiscus
 - tiliaceus

(131) Toward east on limestone outcrops are thickets of Murraya, acacia, Toddalia, Rhusa, Cycas, Miscanthus etc.

(132) A few small plots of acacia confusa, in addition to much of it along trails and on outcrops and stone fences with Cycas, etc.

(133) East of this more open country, still coral outcrops, but fewer hedges and thickets. Some scattered Calophyllum and Erythrina trees.

Plants seen in thickets
and hedgerows.

Cycas revoluta

Acacia confusa

Psidium guajava

Muscantillus floridulus

Ampelopsis

Arundo donax ?

Clematis

Vitis

(134)
(Photo
865-15
and
865-17)

Beach scrub forest
on east coast
slopes toward beach
from height of
Beach from beach is
mainly *Hernandia* and
Pandanus, with
Calophyllum, *Pouteria*
Approaching beach
Scaevola becomes dominant,
with *Messerschmidia*
Quettarda, *Sophora*, *Agave*,
Pnerma, *Wikstroemia*, *Pittosporum*

Along beach *Zoysia*,
Vigna, *Euphorbia*,
Wedelia, *Cassytha*,
Ischaemum, *Spernocia*
Pes-caprae, *Thuarea*
Cuminum, *Chenopodium*,
Vitex, *Spinifex*, *Ilex*
Sporobolus, *Lescurium*, etc.
form a belt back of the active beach, widest
at the point.
South of the east point

(135)

~~At the south end~~ is a
shrine forest that is
merely a very luxuriant
place in the beach forest
with giant *Calophyllum*,
Erythrina, *Ficus retusa*,
Pouteria and *Quettarda*
trees. These trees are
generally with very low
trunks and widely spreading

limbs. The canopy is complete, at about 12 m. There is little undergrowth but a good ground cover of *Nephrolepis*, *Flagellaria* some seedlings of the trees, esp. *Calophyllum*.

There is no actual edifice here, only an open sandy space, oval in outline, about 6 m. across, 10 m. long, with a round stone receptacle with sand for burning incense and a rotted stump with small vases.

It is a quiet and very impressive spot. Some *Aedes* mosquitoes, though, as in all other shrine forests.

Near south end there is a low escarpment of rough limestone rising to 2-4 m.

(136)

At its base in the forest is a layer of peat up to 3 dm. thick.

The limestone is covered generally by ~~beach~~ scrub of

Scaevola *Jandanus* *Guettarda* *Messerschmidia* *Premna*, *Ficus* *retusa* etc. *Lidium* on edges in pits.

Exposed parts have conspicuous mps from about high tide level to 3 m. ~~Exposed~~ A strongly developed erosion ramp about 15 m. wide at base, with solution basins and patches of *Limonium*.

Here the ~~beach~~ forest or scrub is quite narrow. Where the exposed limestone ledge disappears, to the east, the forest gets wider. A dune ridge has accumulated on the outer side of it, just back from the beach. This may be 1-1.5 m. high or even a little more, sloping gradually away from the highest part back of the top of the beach.

Just back of the forest is a large area of *Miscanthus* and small thickets. The stand is irregular but generally

thick, difficult to
traverse, hiding
rough limestone boulders
and outcrops.

June 18 - e.s.e. of Hazama
broken cultivated land
with rough limestone
outcrops, rock piles, and
stone walls.

37544 *Berchemia rhamnoides*

2 rare on rocky places

2 45 *Conyza canadensis*

common in cultivated land

2 46 ~~grass~~ *Crabgrass*

occasional in fallow
grassy field

1 47 *Acalypha*

occasional in fallow grassy field

5 48 *Clematis*

common in thickets
and on rock fences

2 49 *Imperata cylindrica*

dominant in fallow grassy field

2 50 *Zephyranthes*

rare in fallow grassy field

3 51 *Euphorbia heterophylla* L.

common on roadsides
and in fallow fields

5 52 *Abutilon indicum* (L.) Sweet

occasional along trails

20 m.

prostrate.

spreading and ascending.

extensive
climbing vine, flowers
cream white, very fragrant.

rhizomes deeply buried

flowers bright pink;
locally believed that the
blooming of this flower
indicates that it will rain.
herb up to 0.8 m. tall, lower
parts of bracts scarlet

shrub up to 1 m. tall,
flowers orange.

Chum Key, Nakagusuku, Miyako, Iriomote, Ishigaki, etc. (C. 1956)

- 37553 *Gynura*
common weed in fields
- 2 54 *Ligustrum orientale* L.
common weed in fields
- 2 55 *Synedrella nodiflora* (L.) Gaertn.
common weed in fields
- 3 56 *Murraya paniculata* (L.)
common in thickets
- 2 57 *Ampelopsis*
common in thickets
- 1 58 *Musa*
abundant in thickets
- 2 59 *Verbena officinalis* L.
common along paths
- 2 60 *Digitaria*
common in fields
- 2 61 *Abutilon*
occasional along paths
- 2 62 *Leucas*
common in fields and rocky places.
- 2 63 *Cardiospermum*
common along rails and edges of fields
- 2 64 *Emilia sonchifolia* (L.) DC.
common in fields
- 2 65 *Bidens pilosa* var.
common in fields
- 1 66 *Lonicera*
occasional along trails

Feb 8, 0. P. 1. 1. 1.

- erect, aromatic; disk
red; tubes of flowers yellow
flowers yellow.
- flowers yellow
- shrub 1.5 m. tall.
leaves bright green
vine, with greenish
flowers and blue berries.
- small plant, 2 m. tall,
"trunk" dull ~~brownish~~ gray-
brown.
bracts glaucous,
bronz purple,
flowers dull yellow.
- flowers bright lavender
- culms spreading
- flowers white
- climbing, flowers white.
- flowers purple
not much exceeding involucre.
disk yellow, rays
short, white

- June 18 - east of Hazama
in edges of shrine forest
- 37567 *Ehretia dicksoni* var. *japonica* -
common

- 6 68 *Psychotria hainanensis* Hatt.
common in undergrowth
- 4 69 *Croton* *monnina* (L.) A. DC.
common in undergrowth
- 2 70 *Carmichaelia retusa*
occasional in undergrowth
- 3 71 ~~*Claspedotrichum*~~
occasional
- 72 *Diospyros ferrea* (L.) Burser &
occasional

June 18 - Hazama
in village

- 2 73 *Phaseolus mungo*
cultivated in small fields
on coral limestone soil
- 2 74 *Artemisia* *biolineata* (Thunb.)
common along paths
- 2 75 *Echinochloa colonum* (L.) Link.
weed in bean field

20 m.
Nakai

- small tree, ripe fruit
yellow. Wood used in
construction
"kinashi" (Taketomi) "inuchi"
(Ishigaki, Okawa)
- shrub 2.5 m. tall;
flowers greenish white; fruit immature
stipules small, triangular.
- shrub 1 m. tall
- shrub 1 m. tall; fruit
immature.
- large shrub or small tree,
flowers pale green.
- small tree; fruit
immature

20 m.

- flowers greenish yellow,
keel twisted.
"nyoku zu" (W) (b. green bean)
said to be used for bean
sprouts, also made into
sweet soup.
- erect herb branched
from base, somewhat
aromatic.
- culms ascending

37576 *Solanum aculeaticornum* Jacq.
2 edges of thickets

3 77 *Piper* ~~hancei~~ *hancei*
very common, climbing
on stone walls

2 78 *Boerhaavia mutabilis* R.Br.
around stone steps
in ~~the~~ public place

4 79 *Portulaca pilosa* L.
common in paths and
fields.

Aibaru Sabi,
June 18 near east point
of island
littoral ~~forest~~ scrub forest

2 80 *Hibiscus tiliaceus* L.
common in

2 81 ~~acrob.~~ *Pegajura* ~~to~~ *to* ~~of~~ *of*
common on inner edge of

3 82 *Toddalia asiatica* Lam.
common generally in thickets
and on inner edge of

edges of thickets.

herb 0.8 m. tall, ripe

fruit scarlet.

vine, fruit immature,
(red when ripe), "pish" (T)

young tips ~~of~~ of plant

used to flavor rice,

mature fruit dried and

used for pepper.

prostrate; flowers

pinkish, white;

leaves purplish beneath.

prostrate, leaves

fleshy; flowers magenta,

about 6-8 mm. across.

said to have been brought

in as an ornamental

but now has spread

and is a pest. Brought

by one Jimku, so is

called "jimku-gusa".

2-3 m.

small tree, flowers

yellow with maroon

center, turning reddish.

vine climbing in bushes,

flowers yellow, immature

fruit with white strips.

herbage with maroon odor when bruised

scrambling shrub.

140

1954 Ryukyu Is.

- 37583 *Vitis* ^{lutea R. & B.} ^{indichets}
occasional on inner edge of
2 84 *Wedelia* ^{lutea (L.) DC}
common on edges of
3 85 *Colubrina asiatica* (L.) ^{DC}
occasional in edges of
2 86 *Allophylus* ^{luteus (L.) DC}
occasional in edges of
2 87 *Hernandia sonora* L.
dominant in

same

- at top of sandy beach
2 88 *Ischaemum muticum*
common
2 89 *Angelica* ^{lutea (L.) DC}
occasional
2 90 *Cinnamomum asiaticum* (L.) ^{DC}
occasional
2 91 *Euphorbia charissensis* Boiss.
common
2 92 *Spissifex* ^{lutea (L.) DC}
common
1 93 *Chenopodium* ^{luteum (L.) DC}
occasional
2 94 *Cirsium* ^{luteum (L.) DC}
common
3 95 *Vigna muna* Burm.
common
✓ 96 *Lotus* ^{luteus (L.) DC}
common
2 97 *Lotus* ^{luteus (L.) DC}
common

Taketomi I.

141

- vine, flowers greenish.
scrambling aromatic
herb, flowers yellow.
low shrub, flowers white
small tree 4-5 m. tall,
flowers whitish.

1-2 m.

- prostrate, branches
ascending to erect.
erect herb 1.5 m. tall,
now dry and leafless.
rosettes of curved leaves,
erect scapes to 0.8 m. tall,
flowers white, stamens
and style purple.
stems spreading to
ascending.
forming loose mats
erect.
heads bright purple.
prostrate, forming
huge mats; flowers yellow
prostrate, fleshy
flowers pink.
prostrate, flowers white

(L.) L.

142

1956 Ryukyu Is.

~~sames~~ Busashi,
June 13. - south coast
of island
on pitted eroded edges
of limestone terrace

37597_a

~~Sedum~~ locally common.

Hayama Village
Lagenaria cult.
in walls.

3 m.

Tabetani I.

143

fleshy, flowers yellow.

138

June 19 - Kuntomari-saki
extensive sand flat
covered by ~~low~~ scrub
tangled mass of Scaevola,
Pandanus, Guettarda,
Clerodendrum, Porteria,
Pittosporum, Allophylus
Flagellaria, Sophora,

139

South of here is a dune
ridge 1-2 m. high. In
this is a low forest of
Hernandia, Ficus, Porteria
Pandanus, Clerodendrum,
Scaevola, Messerschmidia
~~Portia~~ Guettarda, Hibiscus,
Premna, Calophyllum, etc.
Back of this is a strip
of Scaevola thickets
and cultivated patches.

This strip of forest is generally only 50-100 m. wide.

Near its north end is a trail leading up to a primitive shrine, only a circle of stones with a hollowed out cylindrical nest in it and for burning incense. This forest around the shrine is principally *Fernandus*, some *Guettarda*, *Ficus* and *Porteria*. It is 10-12 m. high, with loose undergrowth of *Chlorodendron* & *Maranta*, etc.

Southward the dune ridge is replaced by a rough limestone terrace, covered by essentially the same forest.

At the first good exposure of this the sand beach sounds hollow when tramped upon.

up to
5 m.
5 ft.

Along the whole southwest coast the forest comes down to the top of the beach, with little or no herbaceous growth. No sand flat with grass, etc. as on the other side. On the north side of Kuntomorisai proper there is a rather broad strip of *Schinifer*, *Thunbergia*, etc.

Then along the west coast there is solid beach rock, clear up to the low beach ridge which is covered by tall scrub. North the ridge is replaced by a ledge of limestone, still with a broad ramp of smooth beach rock.

The scrub along this coast is 2-4 m. high, about the same composition as that south of the point. A few *Casuarina* and very rarely, *Thespesia*. A rather narrow strip, backed by *Leucaena* and *Acacia*.

East of village -
cultivated patch -
and considerable
thicket of *Calophyllum*,
127 *Cycas*, *Melaleuca*,
Podocarpus, *Rachmorus*,
Acacia *confusa*.
Musa, *Melia*, *Ficus* *wrightii*,
Pandanus (abundant
locally)

Just back of the littoral
forest is advance growth
of *Leucaena*. Several
small patches of
densely planted *Calophyllum*,
also one of *Podocarpus*.

Thick undergrowth of
Cycas in one *Calophyllum*
patch. *Leucaena* in others
has been cut out.

Littoral forest very dense
Calophyllum, *Hervandea*,
Pandanus, *Hibiscus*
about 4-5 m high. Comes
close to sea wall.

June 19 - Taketomi island

The vegetation can be mapped, though not too satisfactorily, by setting up the following units (outlined on photo #150-27):

1. Village area - streets lined with stone walls around the house-lots.

Ehretia ^{and} *Morus* trees (about 4 m. tall) and *Garcinia*, and *Podocarpus* trees, tending to be taller, grow along the streets just inside the stone walls. Inside the walls, also, are garden plots and many ornamentals. Vacant lots have patches of sweet potatoes, mung beans, etc.

2. Open cultivated area - a patchwork of small cultivated plots, separated by stone walls, outcrops, hedges, etc. The stone walls and outcrops are covered by clumps of *Cycas revoluta* and thickets of *Acacia* and various shrubs. The principal

crops are sugar cane, mung beans, sweet potatoes, sesame, millet, ^{bananas} ramie, in about order named.

3. Cultivated area with thickets: similar to unit #2 except that as much as 25% of the area may be covered by thickets and small plantings of *Acacia confusa*, *Leucaena glauca*, and various bushes, *Miscanthus*, etc. *Melaleuca* is common.

4. Swind grass - This seems to be abandoned cultivated land, where the rock outcrops are too numerous and soil is too shallow even for these people to farm successfully. The area is a mixture of dense *Miscanthus* up to 2-3 m. tall and woody thickets. Progress through this is very slow and uncomfortable. Hidden rock outcrops, boulders, and holes make walking even more painful.

5. Littoral forest and scrub.

This is a strip around the coast, on sand and rough limestone, of tangled growth of various strand species, in places forming a scrub 1-2 m. high, in other places a low forest, up to 10 m.

The composition varies. The scrubby aspects are usually dominated by *Scaevola sericea* with various accessory species.

The ~~scrub~~ forested part is most often dominated by *Hernandia*, but in some places by *Pouteria*, *Ficus*, or *Pandanus*.

The seaward side usually slopes smoothly toward the beach, suggesting that wind and spray are important elements in the local climate.

On the southeast side and locally elsewhere there is a herbaceous strip, usually on level sand, between the edge of the scrub and the top of the beach. Here may be found *Vitis*, *Ipomoea pes-caprae*

pinifex, *Thuarea*, *Ilex*, *Sporobolus*, *Zoysia*, etc.

6. Shrub forests:

There are small patches of usually dense woods containing some of the largest trees to be found on the island.

The composition varies greatly. *Garcinia*, *Ficus*, "tabu", *Melaleuca*, *Diospyros*, *Calophyllum* and *Pouteria* are the trees most usually found.

Weeds seen, not collected:

Euphorbia prostrata

E. hirta

Portulaca oleracea

Kalanchoe pinnata

melilotus

152

1950 Ryukyu Is.

June 19 ^{0 mazu} Northwest coast
on sand above sea wall37598 *Ipomoea pes-caprae* var. *brasiliana*
common5 99 *Ipomoea* ^{littoralis Bl.}
common37600 *Zoysia tenuifolia* Willd.
common3 01 *Thuarea involuta* (Forst.) R. & S.
common2 02 June 19 - east of Hazama
Polybodium scolopendria
local on pile of limestone
between fields.2 03 June 19 - coast west of
Hazama
Pemphis acidula Forst.
rare on eroded limestone
about high tide level
2 04 *Clerodendrum inerme* (L.) Gaertn.
common, edge of littoral scrub
3 05 *Vitex* ^{littoralis Bl.}
common, at edge of
littoral scrub~~06 Raph~~June 19 - near Kuntomari-saku
littoral scrub forest2 06 *Raphiolepis* ^{(L.) Walp.}
rare in edge of

Taketomi!

153

2 m.

trailing; flowers purple,
collapsing about mid-
afternoon.trailing; flowers rose
purple, much deeper
in throat.trailing, forming loose
mats.

2 m.

Burm. f.

fronds erect.

1 m.

prostrate shrub,
flowers white.shrub 1 m. tall;
flowers white.prostrate, flowers
blue-violet.2-3
m.shrub 2 m. tall,
fruit immature

156

1956 Ryukyu Is.

- 37622 *Pandanus tectorius* var.
5 common in ~~suburban~~ ^{suburban} ~~area~~
2 23 *Terminalia catappa* L.
rare in ~~area~~
2 24 *Pittosporum tobira* (Willd.) Ait.
occasional in scrub
margin

June 19 - coast west of
Hazama, ~~edge of scrub~~
in edge of scrub on
sand flat.

- 2 25 *Ipomoea indica* (Burm. f.)
rare ^{I only to R. G. 1}
2 26 *Lysimachia mauritiana*
occasional
2 27 *Paspalum vaginatum* Swartz
local along beach
1 28 *Ixeris japonica* (Thunb.) Nakai?
local along beach
1 29 *Rhaphanus*
occasional along beach
~~to (acanth.)~~

June 19 - Hazama
around village

- 2 30 (acanth.) *Ipomoea pes-caprae* L. var. *pes-caprae*
common in yard
2 31 *Commelina auriculata* L.
common on roadsides
2 32 *Polygonum* ~~sp.~~
common climbing over walls
2 33 *Commelina ~~radifolia~~*
common on roadsides

Tabetomi I.

157

- small tree 3 m. tall.
fruit yellow when ripe.
shrub or small tree,
3 m. tall, bud only.
shrub 1 m. tall, fruit
immature

1-2 m.

vine tangled in scrub;
flowers blue, turning purple.
flowers white

culms ascending.

rhizomes deeply buried.

~~the~~ flowers purple; plants
mostly dry and fruiting.

20 m.

flowers pinkish.

det. F.R.F.

plant creeping,
flowers blue, 2 petals
large.

vine; flowers white.

det. F.R.F.

prostrate flower blue, 3 petals
large.

158

1956 Ryukyu Is.

Omasu

June 19 - ~~northwest~~
northeast of Hazama

37634

5

Cycas revoluta L.
very common on
walls and limestone
outcrops.

5 m.

Takatomil.

159

trunk 1.5 m. high,
cone erect. Leaves very
immediately around cone.

June 20 - end of Kabira peninsula
back of Ishi-sabai

- (144) Pasture on flat ground
with largest part of area
in mixed palatable grasses
and herbs, with bunches
of *Imperata* scarcely
eaten. At foot of volcanic
hills.

- (145) Rocky hill, mainly grassy
with principally *Imperata*,
Rosa, etc. Scattered
Cycas on slopes and
especially near the top.
The rock is a volcanic
breccia. Many herbs
of various sorts in
grass and between
rocks.

- (146) almost pure stands of
Cycas on very rocky hills.
Some *Pipturus*, *Mallotus* etc.
apparently burned recently
(dead bushes)

- (147) Hill with mixed
broad-leaf woods. - *Ficus*
retusa, *F. ~~pubescens~~ ^{vigata}*, *Hibiscus*
tiliaceus. *Mascaranga*, *Ponteder*
Dioryssa in second story.
much *Alocasia* and *Cycas*

- (148) Strip of littoral forest,
dominantly *Hernandia*, but
on sea side mostly *Pandanus*,
with *Scaevola*, *Messerschmidia*,
Ponteder etc.

- (149) Mostly on a dune ridge
2-3 m. high, but here and
there projections of undercut limestone
Hills with scattering of
bushes in grass and patches
of almost pure *Cycas*
on steeper more rocky places.

- (150) Cliffs and bluffs on south
side covered with thicket,
more level ground above grassy,
pastured, in places with
bunchy *Imperata*.

(151)

Taka mari, near
June 20 - end of Kabira
Peninsula, back of Ishi-saku
or knobs of volcanic rock

37635

(~~tab~~) *Abutilon* (*Abutilon*?)
thickets

36 *Physalis* *physalis* L. var. *whiff*
among cycads in pasture

37 *Euphorbia* *parviflora* (L.) Hay
grassy pasture

38 *Adiantum pilosa* Ledeb.
in edge of patch of woods

39 *Panicum* *polystachyon* (L.) Steud.
in rocky pasture

40 (~~crust~~) *Malva* (*Malva*?)
climbing on rocks

41 (~~grass~~) *Brassica* (*Brassica*?)
in grassy pasture

42 *Trilisa*? *T. trisulcata*?
among rocks in pasture

43 *Hedyotis* *lanceolata* (L.) Merr.
among rocks in pasture

44 *Leucas* *leucas* (L.) Merr.
among rocks

45 ~~*Lathyrus*~~ *Clinopodium* *lanceolatum* (L.) Merr.
among rocks

46 *Evolvulus alsinoides* L.
common among rocks

47 *Graphalium japonicum*?
rare among rocks Thunb.

same - inner edge of littoral forest

48 *Portulaca* *portulaca* var. *lanceolata* Merr.
rare at

Ishigaki Is.

20 m.

↓ flowers pale greenish yellow

flowers white.

~~same~~ flowers yellow.

40 m.

↓ Trailing; ~~ripe fruit red~~.

flowers white.

flowers white.

30 m.

↓ flowers white

flowers rose-purple.

flowers bluish

2-3 m.

shrub 2 m. tall; fruits
green, pleasantly acid.

1956 Ryukyu Is.

June 20 - YCAT Compound

3 km. n.w. of Ishigaki City

weeds in disturbed open ground

37649 *Cenchrus echinatus* L.

2 common

2 50 *Euphorbia hirta*common (var. *hirta* (L.) DC.)2 51 *Cyperus* *sp.* (L.) H. B. K.

small colonies

5 52 (*acanth?*) *Polypodium* *sp.*

common

5 53 *Solanum nigrum* L.

common

1-2 m.

1-2 m.

flower lavender pink
 with 3-lobed purple
 mark in center of lip.
 erect, flowers white,
 ripe fruit black.

June 21 - ridge above Ozeta
west of Kara-Lake

(152)
(Photo
978-4)

Forest on ridge of scrub -
the lowest parts of
this are dense and tangled
and scrubby, perhaps
are secondary. (60-100 m.)

(153)

The main part of the
ridge is in a mixed
forest that is dominantly
Ficus of several species
but has many Lauraceae
Raphiolepis, Randia, etc.
Thick undergrowth of
Arenca, Psychotria,
Lasianthus, Alocasia,
etc. Laccandra, Lauraceae,
many ferns, lianes
such as Flagellaria, etc.
(100-150 m.)

154

Upward along the ridge (150-180 m.)
the Ficus becomes less
dominant but still common.
Diospyros becomes
commoner, also Ardisia,
and many other trees
come in. A little
Freycinetia and large
Aroid vine.
Some Elaeocarpus, Schefflera,

Lauraceae, thick
undergrowth of
Psychotria, Arenca,
Lauraceae shrubs
and seedlings, many
ferns and Centotheca
on ground.

On next ridge over (180-200 m.)
the Ficus becomes less
common, but still present.
Diospyros, Ardisia,
Lauraceae, Porteria,
Elaeocarpus, ~~Bischoffia~~
Styrax, Mallotus philippensis
some Garcinia. One
Dendropanax seen, small.
Some secondary species - e.g.
Macaranga, Mallotus,
Bischoffia, etc. probably
the result of the intensive
logging that is obvious
here.

Ferns cover the ground
under a loose shrub
layer of Psychotria,
Lasianthus, etc.
Tectaria most abundant.
Some Asplenium nidus
in trees. Aroids climbing
in trees - perhaps Epipremnum.

168

(156)

(photo 950-110)

Here on a long ^(200 m.) more or less level ridge *Quercus* comes in in considerable numbers. Some *Elaeagnus*, *Dendropanax*, much *Andros*, *Diospyros*, many *Lauraceae*. Ferns abundant. Some *Fragaria*.

On ridge the forest is about 10-12 (-15) m. tall, a few trees to 2.5-3 dm. mostly 10-20 cm., some larger Ficus.

Undergrowth rather thin - Psychotrias, Antidesmon, Lauraceae, many ferns.

June 21 - ^{Ntana Yama,} ridge above Ozato,
~~west of Kanadake~~

100-150 m

occasional

5 55 *Xanthoxylum*
occasional

2 56 Tubocapsicum?

rare, along trail

57 ~~Centotheca~~ ~~capitata~~

common locally

3 58 *Aranga tremula* (Blanco) Bacc.

common in undergrowth.

vine climbing in trees,
fruit immature.

small tree, tangled
in mass of vegetation,
fruits green.

- branched herb, 0.8 m. tall,
- fruit bright red, soft.
- prostrate to ascending

$(\overline{E} + \overline{E} \cdot \overline{E} \cdot \overline{E})$ per.

several stems from base
inflorescence reaching
about 2 m. high, leaves 3-4,
stem ~~only to~~ covered by
sheathing leaf bases.

same - mixed broad-leaf
evergreen forest on broad
ridge top.

37639 *Flagellaria indica* L.
common generally

2 60 *Diospyros*
common generally

5 61 *Smilax*
common

5 62 *Citrus*
occasional in understory

5 63 (orchid) *Heliconia*
occasional, terrestrial

2 64 *Carnellia*
occasional

5 65 *Ficus*
occasional

5 66 *Ophiorhiza*
common locally

2 67 (orchid) *Heliconia*
rare, terrestrial

5 68 *Neolitsea*
occasional

3 69 *Stemodia* (Horn) *Stemodia*
common

same - in montane forest,
with much *Quercus*

5 70 *Antidesma*
common in undergrowth

5 71 *Ficus retusa*
occasional

150 - 200 m.

59 tangled vine climbing
into tree-tops; fruit immature.

small tree, fruit dull
brownish orange

vine climbing in trees,
fruit immature.

62 small tree 4 m. tall,
fruits immature, aromatic.

in small clumps,
flowers white.

small tree; fruit immature.

large spreading tree
with single, somewhat
buttressed trunk.

no aerial roots. yellow fruit.
suffrutescent, 4 dm. tall,
flowers white.

stems twisting,
flowers minute, bronged.

small tree; fruit immature

200 - 225 m.

shrub 1 m. tall, fruit
immature

large spreading tree
with complex trunk

1974

quinquegona Bl.

37672

Ardisia

3

common

3 73

Vittaria

epiphytic

5 74

Nephrolepis

epiphytic, ~~fronds pendent~~

6 75

Ardisia

common

June 22 - ~~at~~ Banna Lake

(157)

(photo)

940-10)

n.w. base. Pine wood. fairly good stand on gently sloping terrace - trees up to 20 m tall and 2-3 dm. dbh. spaced 3-5 m.

Very few shrubs beneath, sparse stand of Miscanthus some Paspalum conjugatum with Elephantopus mollis. Has been somewhat pastured.

(158)

On lower slopes a tangled scrubby mass of Malva, Wendlandia, Schima and other secondary shrubs with Miscanthus. A little pine and Acacia.

shrub 2 m. tall

fronds pendent

small tree 4 m. tall, branches disarticulating.

(159)

upper slopes and summit are covered by a low scrubby very dense wood of trees 3-5 m. tall. Mostly things such as Quercus, Ilex, Distylium, Elaeocarpus, etc. with rather small coriaceous leaves.

(160)

On the inner side of the rather V shaped series of ridges larger trees seen more abundant on the mid slopes and tree ferns are common in ravines.

On the main ridge
the low forest is very
dense, 4-5 m. tall. *Quercus*
is common, also *Camel*,
Ardisia tabui, *Trema*,
Mallotus, *Macaranga*,
Diospyros, *Dendropanax*,
Ilex, *Ficus* 3 spp. *Rhus*,
Wendlandia, *Phyllanthus*,
Eugenia, *Psychotria*,
Cinnamomum, *Euscaptis*,
Antidesma, *Styrax*, *Larandra*.

The stems are mostly
2-5 cm. d.b.h. a few much
larger, these mostly *Quercus*.
The spacing is mostly
0.5-1 m.

On the ground are
scattered ferns (*Polystichum*)
etc., tufts of sedge (*Scleria*?)
and *Carex* *alpina*.

Some *Freyinetia* in saddle.
also much *Colysis*.
Yamag, brown with dark
bands, or *Ardisia*.

Continue trail around
to east from beyond
saddle - on steeper
slopes the vegetation
does not differ much
from on ridge, except
that stature may be
a little greater and ferns
(*Colysis*) locally more
abundant.

This trail leads
around to what almost
amounts to a terrace -
an area of very gentle
slope. Here the trees
are taller, up to 10 or more
m. and more widely
spaced. Composition
does not differ conspicuously.
More *Ficus* here but
not dominant. *Quercus*
still common. Ferns
common but not abundant.

Another trail from
bottom of saddle around
to west and south
through essentially
similar vegetation
to that on ridge, on steep
slope. Down somewhat
the stature is some higher.
Ardisia more common.

Two Yamagi seen on *Amilax*. These were brighter brown than usual and decorated with 2 rows of yellow and black points. The two transverse ~~rows~~ of bands of black hair on antenae are hidden when animal is quiet, asserted when excited. Crawled off similar onto trunk of *Cinnamomum doederleinii*.

Kora Yama
June 22 - Pass west of Banna-lake

- in low coppice-like wood 50 m.
- 37676 *Diandella ensifolia* (L.) DC.
5 common on walls of road cut on ~~shale~~ weathered schist.
- 5 77 *Stephanis japonica* (Thunberg) Nakai
edge of wood
- 6 78 *Prunella* ~~sp.~~ *Prunella*
occasional
- 6 79 *Vaccinium* ~~sp.~~ *Vaccinium*
occasional
- 6 80 *Alnus* ~~sp.~~ *Alnus*
common, especially in lower moist spots
- 5 81 *Vitex trifolia* L.
on wall of road cut

In Pass, on west side, is a coppice-like growth of *Quercus*, *Phanstrakemia*, *Lichina*, *Alnus*, *Myrsine* (?), *Laurus*, etc. about 3-4 m. tall all apparently clumps of stump sprouts.

- flowers light blue, ripe fruit bluish purple.
- vine twining in trees; fruit red.
- small tree 4 m. tall, fruit green.
- slender shrub 2.5 m. tall; fruit immature
- small tree
- shrub 1 m. tall, flowers deep lavender to violet.

1954 Ryukyu Is
Tsukunatsuki,

27

June 22 - s.w. base of
Banna-lake

37682
5

Jussiaea
roadside

Muibaga,
June 22 - s.w. ridge
of Banna-lake
roadside in scrubby
woods.

5 83

Isleria
common in deep grass

8 84

Smilax
occasional

6 85

occasional in pine woods

86

Glochidion
common

Taramani,
June 22 - Banna-lake,
in scrubby woods near
summit

2 87

rare

5 88

Ficus
occasional

5 89

Osmanthus
occasional

5 90

Osmanthus
occasional

Fast. 37685
Det. L. H. Pallen
Det. L. H. Pallen

Yucca
Nerium
Record
in Yucca

Metel
I have determined the name of

white

in m. long

nit ably

legum

ial

Yours might

be the

second time

you

notebook,

I haven't determined the war yet

Feb 37675

201. 10/10/10 (2/1)

Dr. L. H. Walby

Dec. 1. 1910

Ch'ien, Ch'ung-shu; Wu, Ch'ong-i; ^{and} Ch'ên, Ch'ang-t'u.

1956

The vegetation types of

China. Act. Geogr. Sin. 22: 37-92.

In Chinese, with English summary; describes 12 forest, steppe, meadow and desert types.

1954 Ryukyu Is

Tsuburatsaki,

June 22 - s.w. base of
Bana-dake37682 *Jussiaea* ~~affinis~~ *sp.*
roadside

Muibaga,

June 22 - s.w. ridge
of Banna-dakeroadside in scrubby
woods.5 83 *Iscleria* ~~terrestris~~ (L.) Tardif

common in deep grass

8 84 *Smilax* ~~oleacea~~ *sp.* ^{det. H. H. H.}
occasional6 85
occasional in pine woods86 *Glochidion*
common

Taramani,

June 22 - Banna-dake,
in ~~scrub~~ scrubby woods near
summit2 87 *Iscleria* ~~terrestris~~ *sp.*
rare5 88 *Ficus* ~~sp.~~ *sp.* ^{det. H. H. H.}
occasional5 89 *Osmanthus* ~~sp.~~ *sp.* ^{det. H. H. H.}
occasional5 90 *Osmanthus* ~~sp.~~ *sp.* ^{det. H. H. H.}
occasional

80 m.

Much branched herb
1.5 m. tall, petals
yellow, emarginate, 1 cm. long.

180 m.

forming tangle; fruit
yellow-green, probably
nearly mature.small tree, fruit
immature.shrub 3 m. tall;
flowers yellow.

220 m.

shrub 2 m. tall
inflorescence red, fruit dark green.shrub 2 m. tall,
figs greenish.small tree, flowers
pale yellowish green.fragrant with a sourish
sweet odor.small tree; flowers
white

180

1956 Ryukyu Is.

37691

Ilex ~~unidentified~~ ^{occasional}

5

1 92

~~Pavetta?~~ ^{rare}

2 93

Morinda umbellata L.
^{rare}

5 94

Ilex ~~unidentified~~ ^{occasional}

6 95

Psychotria ~~unidentified~~ ^{rare}

6 96

Premna obtusifolia A. B.
^{occasional}

June 22 - north ridge
of ~~Banana Lake~~ Taramani
in ^{low} scrubby dense moist
forest

6 97

Ardisia
^{common}

98

Rhus succedanea L.
^{common}

181

small tree, fruit immature.

shrub; buds white.

vine, climbing in trees.

small tree; fruit
immature.small tree; fruit
immature.small tree, aromatic
when broken; flowers
pale green.

200 m.

slender shrub 2m.
tall; fruit immature.
small tree, leaves
tending to turn red;
fruit green.

June 23 - ~~marsh lake~~
~~steep slope~~,
 steep slope ($45^\circ \pm$) of chert
 covered by a mixture
 of grass and low brush.
 The grass is a mixture
 of Imperata, small
 Andropogon(?), Paspalum,
 etc. Sphobolus elongatus.

(161)

(photo
 940-7 for
 #161-167)

- Brushes are
 a Osbeckia o Psidium
 o Rhodomyrtus o Symplocos
 p.c. Eurya 2 spp.
 c Ficus 3 spp.
 la., c Pinus (seedlings)
 o Glochidion
 o Mallotus
 much o Nephrolepis exaltata
 c Dianella ensifolia
 f Elephantopus mollis
 f Eupatorium sp.
 f., la. Lygodium
 some c Rubus (small sp.)
 ~ Bidens pilosa
 ~ Commelina
 ~ Adiantum sp.
 c la. Thelypteris sp.
 ~ Wahlenbergia
 ~ Fimbristylis
 ~ Emilia sonchifolia
 c Melast. or Lyth.
 o Lerpedeza cuneata

Same colonies of Gleichenia
 linearis on steep places.

(162)

Toward the top of the
 ridge Symplocos
 becomes abundant and
 very near the top Vaccinium
 appears in some numbers.
 Thelypteris is very
 abundant at the top,
 some Andropogon, much
 Eupatorium.

Miscanthus is scattered
 on top, especially in
 edges of brush.

(163)

The east slope is
 densely brush-covered,
 the brush coming up
 to a sharp line at the
 crest. A few larger
 pines on the ~~so~~ crest, many
 saplings locally.

The scrub on the north
 slope is mixed in compo-
 sition:

Raphiolepis	Eugenia
Eurya	Pittosporum
Vaccinium	Randia
Mallotus	Ardisia
Symplocos	Ilex
Distylium	Ficus 2 spp.
Celastr.	Psychotria
Dendropanax	Wendlandia

This scrub is a dwarf forest about 3-4 m. tall, of erect slender stems mostly under 1 cm. thick, some larger. Mostly in clumps as though ~~the~~ groups of stump sprouts. A very few shrubs - Psychotria. Sparse ground cover of ferns (Polystichum, Pteris, etc.) and seedlings. Small Asplenium nidus on chert boulders.

Some vines - asclepiads, Smilax.

Scattered tufts of a broad leaved grass, sterile.

(164)

Slopes below summit ^{on} west side are thickly covered by a mixture of Miscanthus and such shrubs as Eurya, Rhys, Ficus, Lycopodium, Psidium and seedling pines, with a few scattered larger pines. Much Smilax and several other vines.

(165)

Pandanus in tangled scrub in shallow ravine on west slope almost to top of ridge at saddle.

(166)

At the foot of the hill is a band of dense Acacia confusa with chimbs filled by Miscanthus. Very little undergrowth or ground cover, but some Smilax vines.

(167)

Below this, on flattish ground, just above the paddy fields is a solid stand of Paspalum conjugatum.

This scrub is a dwarf forest, about 3-4 m. tall, of erect slender stems mostly under 1 cm. thick, some larger, mostly in clumps or in small bunches of stump sprouts.

~~Alone~~ Ground layer very sparse - scattered ferns (*Polystichum*, etc.) and seedlings.

June 23 - Marakehake, summit ridge

in open brush and grass

37699 *Canavalia microcarpa*
rare, climbing in bushes

37700 *Aeginetia indica* L.
rare on open bits of soil

2 01 *Hypericum*
very local in thin places in grass

2 02 (~~act.~~) *Fragaria* (~~act.~~)
common locally

2 03 (~~pass~~) *... ..*
occasional

83

185 m

vine; flowers rose pink, pods somewhat inflated.

leafless, from mass of fleshy roots on the bottom of a thickened stem or corm; stem ~~long~~ and spathe bronze, striped with purple, corolla white, slightly purplish toward base, lobes deep purple.

erect, flowers orange-yellow.

scandent shrub; fruits somewhat immature, aromatic when crushed.

403 *... ..*

- June 23 - same - in
edges of dwarf forest
37704 ~~asclap.~~ *Asclepias* (officinalis?)
5 climbing in trees
5 05 *Asclepias* *Asclepias*
common
✓ 06 *Randia flavida* *Randia*
rare
5 07 *Vincetoxicum* *Vincetoxicum*
common, climbing in trees

00

June 23 - Massiatake,
south slopes

- 5 08 *Mussaenda* *Mussaenda*
in acacia thicket

- 6 09 *Rhodomystus tomentosa*
occasional on slope

- 5 10 *Eupatorium* *Eupatorium*
common *quasi-silvicol*

180 m.

woody vine.

shrub 2 m. tall; fruit
immature.

shrub 1.5 m. tall, flowers
white.

vine; petals maroon,
bronze in center of lobes,
corolla white.

100 m.

scandent shrub,
twining in shrubs,
flowers yellow;
fruit immature.

140 m.

shrub 1 m. tall

150 m.

erect suffrutescent
herb; flowers, pale lavender,
honey-scented.

May 24.

Schist outcrops in
Imperata pasture.

Andropogon 2 spp.

Lilium longicolum

Lespedeza cuneata

Borreria

Oxalis corniculata

Setaria

Wahlenbergia

Artemisia

Rubus

Lygodium

Lactuca

Psidium

Centella

Phaseolus

Urena

Gynura

Cyperus 2 spp.

Panicum

Fimbristylis.

Imperata

Ernia sonchifolia

Ficus erecta

Ficus retusa

Morus

Carmona

May 24 - Tozota

patches of Eocene
and post Miocene
limestone covered by
a bushy forest of
Pipturus, Ficus,
Macaranga, Clerodendron,
Melia, Whinnaya
with Alocasia
around edges.

Cultivated patches
of beach deposit soil
(Shioya?) - sugar
cane, sweet potatoes,
sesame, etc.

37711 *Sesamum indicum* L.

5

cultivated on limestone soil

6

12

Pipturus arborescens (Link) C.B. Rob.

Rob.

important part of vegetation
on limestone

5

13

Pipturus arborescens (Link) C.B. Rob.important part of vegetation
on limestone

5

14

Boehmeria nivea

on rough limestone

5

15

Amaranthus sp.weed in edges of cultivated
fields.

June 24 - 2 km 25° W. of m. of
mouth of Todoroki-gawa
in small desiccating
fallow rice field

5

16

Fimbristylis sp.

common

5

17

Cyperus sp.

common

2

18

Limnophila antipoda

occasional

19

Hypericum sp.

common

erect, flowers white,
turning faintly lavender.
— shrub 3 m. tall,
flowers green, fruit
with white fleshy
receptacle, nutlets
borne in pits, not adnate
to receptacle.

— shrub

14 ~~shrub~~ bush 1.5 m. tall,
sprawling.

50 m.
↓
Morigama Distr.

14 caespitose, stems soft,
light green.

erect, flowers deep yellow

June 24 - same -
in schist exposures in
grassy pasture

37720 *Andropogon*
occasional

2 21 *Scleria*
rare

2 22 *Fimbristylis*
rare

1 23 *Euphorbia*
occasional

2 24 *Verbena*
occasional

1 25 ~~*Banania*~~
rare

2 26 *Panicum*
common

50m

↓

at 11
fertile (seed) A common but very rare in the
at 11

erect, flowers white.

flowers white

50m

at 11
at 11

196

197



Scale 1:50,000
 (Contour interval 10 meters)
 (Scale of map 1:50,000)
 (Scale of map 1:50,000)
 (Scale of map 1:50,000)



- 1. Kuroda-mura
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- 99. Kuroda-mura
- 100. Kuroda-mura

64TH ENGR BASE TOPO BN BN 2573 KA 2/52-3 M

INDEX TO ADJOINING SHEETS

5152 I	5152 IV	5152 I
5152 II	5152 III	5152 II

28 June 1956 4M

Eucalyptus

Marrubium *mollis*; *Ficus erecta*, *F. superba* var. *javanica*,
F. "ribofruit"; *Alocasia cucullata*; *Smilax* sp.; *Morus australis*;
Garcinia spicata; *Bischofia javanica*; *Stictocardia*
tiliaefolia; *Macaranga tanarius*; *Mallotus moluccanus*;
Broussonetia papyrifera; *Rhus succedanea*; *Ardisia*
sieboldii; *Microlepia* sp.; *Arenga engleri*; *Fagoria indica* (?),
Diospyros maritima; *Smilax*; *Murraya paniculata*;
Peperomia sp.; *Rhaphiopsis lukienensis*; *Premna obtusifolia*;
Hernandia peltata; *Ehorita thyrsoiflora*; *Asplenium nidus*;
Pittosporum tobira; *Calliandra japonica*; *Hoya carnosa*;

28 June 1955

Asy. ...

Eocene ...

Mallophus paniculatus; *M. moluccanus*;
Pisonia umbellifera; *Ficus erecta*; *F. superba* var. *pinnata*;
F. retusa var. *brida*; *F.* "ribbed fruit"; *Smilax* sp.;
Alocasia cucullata; *Colocasia* sp.; *Monstera deliciosa*;
Diospyros morrisiana; *D. japonica*; *Hoya carnosa*;
Aronga engleri; *Pteris* sp.; *Asplenium* sp.; *Asplenium*;
nidus (*Neottia nidus*); *Nephrolepis cordifolia*;
Lygodium scandens var. *microphyllum*; *L. flexuosum*;
Piper sp.; *Peperomia japonica*; *Fagaria indica* (?);
Pittosporum tobira; *Psychotria serpens*; *Glycymeris japonica*;
Tournefortia japonica (not in *Flora Obovata*); *Callicarpa japonica*;
Zarcosyllum arnotianum; *Toddalia asiatica*;
Murraya paniculata; *Fraxinus griffithii*; *Breynia rhamnoides*;
Sapum sp.; *Phyllanthus* sp.; *Morus australis*; *Ficus*;
Eliaceus; *Buenavia* sp.; *Rhus sumatrensis*; *Cornus vetula*;
Pueraria tonkinensis; *Quercus myagris*; *Cudrania cochinchinensis*

Callicarpa dichotoma (Lour.) K. Koch
38552

C. iniomotensis Masam. 37191,
37289 ✓

C. japonica Thunb. ✓

38407, 38315, 38546, 38180.

C. japonica var. *luxurians* Rehd. ✓

37869, 38067, 38298,

37763, 37857, 37066

det Moldenke

H.N.

Determinations by E. H. Walker,
Book 45

- obovata* *naka* *slip*
(4) ✓ 37028 *Securinega flueggeoides* M.-A.
✓ 37160 *Sarcandra glabra* (Thunb.) Nakai
✓ 37192 *Gymonosphaera podophylla* (Hook.) Copel. det C. V. Morton
~~372~~
✓ 37211 *Castanopsis* ~~xxxx~~ *cuspidata* (Thunb.) Schott
✓ 37225 *Sarcandra glabra* (Thunb.) Nakai
✓ 37256 *Alchornea trewioides* M.-A. (var. *formosana* Pax?) (not *Mallotus* as previously reported).

- obovata*
amotati ← (1)
" (1) ← ✓ 36976 *Spiranthes stylitis* Zoll.
✓ 36994 *Tarenna gyokushinkwa* Ohwi (not *Randia cochinchinensis*)
✓ 37011 *Smilax* (*Heterosmilax*?)
✓ 37019 *Canavalia* sp.

✓ 37170 *Spathoglottis* ^l*picata* Bl.
✓ 37239 *Calanthe fauriei* Schl.
~~37285 *Stereosandra javanica* Bl. det. L. A. Garay~~

- obovata*
make slips (1) ✓ 36990 *Lygodium microstachyum* var. *glabrescens* Nakai
✓ 37071 " "
✓ 37148 *Ficus benguetensis* Merr.
✓ 37214 *Elaeocarpus sylvestris* var. *ellipticus* (Thunb.) Hara

- ✓ 38050 *Neolitsea ohbana* Koidz. det. C. K. Allen
✓ 37822a *Eleocharis ochrostachys* Steud. det. H. K. Svenson



